DOCUMENT RESUME

ED 201 163 EC 132 598

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TITLE	Multiple Evaluation of a Model Habilitation and Education Program for Severely Handicapped Adults. Final Report.
INSTITUTION	Oregon Univ., Eugene.
SPONS AGENCY	Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C. Div. of Innovation and Development.
PUB DATE	Dec 80
GRANT	G007605455
NOTE	107p.
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	Adults; *Demonstration Programs; Evaluation Methods; Models; *Program Evaluation; *Severe Disabilities; *Sheltered Workshops; *Vocational Rehabilitation

ABSTRACT

The project addressed the discrepancy between research (documenting the vocational potential of severely handicapped adults) and current services (which include an expanding national program of nonvocational day activity centers) with five coordinated components designed to improve, implement, and evaluate vocational services. The first component, concerned with the development of improved habilitation procedures applied single subject research strategies to evaluate solutions to common habilitation problems. The second component, responsible for defining a total program model, prepared a detailed procedures manual and revised it during 3 years of field testing. The third component developed and/or investigated the applicability of six instruments for program evaluation efforts. The fourth component was responsible for implementing and field testing the model over a 3 year period in programs serving severely handicapped adults in four communities in three Western states. The fifth component, program evaluation, investigated the effects of the model on 63 severely handicapped participants. Participants learned a total of 43 different work tasks, and performed these at rates resulting in hourly wages more than twice the average for retarded adults in sheltered workshops and work activity centers. Participants also showed improvements in other aspects of adult living, including increased social responsibility and decreased maladaptive behavior. (Author/DB)

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Final Report

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Grant No. GOO 760 5455

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MULTIPLE EVALUATION OF A MODEL HABILITATION AND EDUCATION PROGRAM FOR SEVERELY HANDICAPPED ADULTS

December, 1980

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education

Bureau of Education for the Handicapped
(Division of Innovation and Development, Research Projects Branch)

EC132598

Abstract

Although research documenting the vocational potential of severely handicapped adults has now become commonplace, an expanding national program of non-vocational day activity centers serves over 100,000 handicapped individuals. The project addressed this discrepancy between research and current services with five coordinated components designed to improve, implement, and evaluate vocational services.

The first component, concerned with the development of improved habilitation procedures applied single-subject research strategies to evaluate solutions to common habilitation problems. Twenty-two reports of that effort have been disseminated. The second component, responsible for defining a total program model, prepared a detailed procedures manual and revised it during three years of field testing. The third component developed and/or investigated the applicability of six instruments for program evaluation efforts. The fourth component was responsible for implementing and field testing the model. This was done over a three-year period in programs serving severely handicapped adults in four communities in three Western states.

The fifth component, program evaluation, investigated the effects of the model on severely handicapped participants. Participants learned a total of 43 different work tasks, and performed these at rates that made hourly wages in production more than twice the national average for all retarded adults in the United States sheltered workshops and nearly three times the average for Work Activities Centers. These work related advances were complemented by suggestions of improvements in other aspects of adult living. Pre- and Post-test differences approached significance on measures of social responsibility and maladaptive behavior; higher wage earners also were perceived as advancing more than others on measures of independence and competence.

The project provides a longitudinal illustration of the potential vocational competence of severely handicapped adults. As such it has significant implications for changes in state and federal programs that now support the development of non-vocational community programs.

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Eugene, Oregon

December 1, 1980

The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF
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Preface

Research conducted in service settings is successful only when service providers, public agency administrators, and researchers share a commitment to the investigation's outcome and an ability to coordinate efforts despite differing short range objectives, constraints, and needs. Since this project required not only that such cooperation be developed, but also that it be maintained over a three year period in four service programs in three separate states, we are understandably indebted to many individuals whose skill and commitment were critical to the success of the project.

Administrators and staff members of agencies responsible for community services for severely handicapped people supported the project directly through funding of services provided in the replication sites evaluated by the project and indirectly through the development of state policies supportive of work opportunities for severely handicapped adults. We particularly thank John Stern, Lee Valenta, and Suzy Hubbard of the Washington Bureau of Developmental Disabilities, David Isom of the Oregon Mental Health Division, and Jack Middleton and Louis Beermann of the Nevada Division of Mental Health and Mental Retardation. State efforts received full support from regional Developmental Disabilities offices, and for this, we are indebted to Dr. Sid Justice and Martha Hislop.

Managing the community programs that used the Specialized Training Program Model required exceptional expertise and diplomacy. Program directors simultaneously filled roles as community service managers, participants in research and evaluation efforts, and participants in significant change in public and professional assumptions about severely handicapped adults. Much of the project's success must be attributed to the directors of the programs with which it worked: Candace O'Neill and Paula Surmeier in Seattle; Jim Medford and Ray Jensen in Spokane; Dennis Sandow in Bend; Brian Lahren, Klaus Ludwig and Steve Lovelace in Reno; and Heidi Rose, John Yeates, Bonnie Wuerch and Tom Schwartz in Eugene.

The University of Oregon provides a unique atmosphere for conducting applied research. With leadership from Robert H. Schwarz, the University's Center on Human Development, provides support for a variety of projects that eliminate traditional barriers between college and community. The Center attracts many highly qualified students and research staff who are challenged by the problems presented by daily service to handicapped people. We have been fortunate to work with many such people during the three-year project and would like to acknowledge the special efforts of Dean P. Inman, Fred Crowell, Nancy Weissman-Frisch, Dan Boomer, Ed Schwallie, David Brown, H. E. Pitts. Russell Gersten provided invaluable assistance in analysis and reporting of the data on instrument development and non-vocational gains.

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Chapter 1

INTRODUCTION

I. Overview of the Report

This report is one of three volumes that detail the work of a three-year Field Initiated Research Project funded by the Bureau of Education for the Handicapped. The project addressed several individual treatment and program development issues that limit the participation of severely handicapped individuals in the mainstream of community work life.

This volume is designed to serve both as a summary report to the funding agency and as an abstract for professional distribution and review. The final report of the project also includes two research monographs that describe effective habilitation procedures. These additional reports are:

1. Bellamy, T., Horner, R., & Inman, D. (Eds.), Vocational habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program. Volume II. Eugene, Oregon: University of Oregon, 1977. Distributed at cost of printing by the Rehabilitation Research and Training Center, University of Oregon, Eugene, Oregon 97403.

2. Horner, R. & Bellamy, T. (Eds.), Vocational habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program. Volume III. Eugene, Oregon: University of Oregon, 1980. Distributed at cost of printing by the Rehabilitation Research and Training Center, University of Oregon, Eugene, Oregon 97403.

To describe the project, the present report: (a) outlines the rationale for developing vocationally-oriented community services for severely handicapped adults; (b) describes the development of the project from earlier work in the Specialized Training Program at the University of Oregon; (c) details the objectives and anticipated benefits of the project; (d) outlines the activities and results of each major project component; and (e) discusses the implications of project results for both program and policy development in community services for severely handicapped people.

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II. Rationale

A. Service Problem

As an applied research effort, the project was designed to develop knowledge that could be directly used in services to handicapped people. The particular service problem addressed is that presented by the increasing number of severely handicapped adults who are community residents. The Bureau of Education for the Handicapped has invested heavily in development of public school services for severely handicapped children. There has been no comparable initiative in the development of adult services, however, and the real possibility exists that severely handicapped individuals may leave school with no better community options than their predecessors who were denied access to public education. Information is needed that will assist in delivery of services to severely handicapped adults, so that they can participate in the full array of normal community activities and experiences. An aspect of participation that is critically deficient in existing services is that of work opportunity. Community employment of severely handicapped adults, even in sheltered workshops, is the exception rather than the rule. Instead, a variety of activity and educational programs have emerged, presumably as precursors to or replacements for vocational opportunities. The expansion of these non-vocational programs despite research on the vocational potential of severely handicapped people provided the focus of the applied research objectives of this project.

B. Population Definition

Severely handicapped individuals were defined by the project in accordance with accepted usage among special educators. This differs significantly from definitions used in rehabilitation and other adult service agencies, where the terms "severely disabled," "developmentally disabled," and "severely handicapped" refer to a much larger group of service consumers.

General parameters defining the severely handicapped population addressed in the project were provided by the definition prepared by the Bureau of Education for the Handicapped:

> "Severely handicapped children" are those who because of the intensity of their physical, mental or emotional problems, or a combination of such problems, need educational, social, psychological, and medical services beyond those which are traditionally offered by regular and special educational programs, in order to maximize their full potential for useful and meaningful participation in society and for self-fulfillment.

(a) The term includes those children who are classified as seriously emotionally disturbed (including children who are schizophrenic or autistic), profoundly and severely mentally retarded, and those with two or more serious handicapping conditions, such as the mentally retarded blind, and the cerebral-palsied deaf.

(b) "Severely handicapped children" (1) may possess severe language and/or perceptual-cognitive deprivations, and evidence abnormal behaviors such as: (i) failure to respond to pronounced social stimuli, (ii) self-mutilation, (iii) self-stimulation, (iv) manifestation of intense and prolonged temper tantrums, and (v) the absence of rudimentary forms of verbal control, and (2) may also have extremely fragile physiological conditions."

The project's major departure from this definition was a focus on those individuals who were of adult age and who were not affected by major motor disabilities affecting the hands and arms. This careful specialization supported the development of procedures for those individuals for whom training and behavior management, rather than bioengineering, appeared to be the primary intervention needed to develop vocational competence. The definition also ensured that the project would serve individuals who represented the most difficult cases confronting adult service agencies.

C. Expanding Community Services

The number of severely handicapped adults residing in their native communities, and thus requiring local habilitation services, has increased dramatically during the last decade. The original project proposal noted that:

(1) The extension of public school services to severely handicapped children could be expected to decrease the likelihood of institutionalization during school age, and thus create a need for community services for this new group of school leavers.

(2) State and Federal policies supporting deinstitutionalization, reinforced by professional values emphasizing normalization objectives, likely would result in community placement of many previously institutionalized severely handicapped adults.

(3) By placing priority on services to severely disabled individuals, the Rehabilitation Act of 1973 could expand the entitlement of severely handicapped people to community services, thereby reducing the perceived need for institutional placement.

In the four years since the proposal was written, the need to prepare for expanding community services for severely handicapped people has become even more evident. The Pennhurst order and subsequent related consent decrees in other states suggest that the differential effectiveness of institutional and community services, like the earlier separate and unequal schools for blacks, violates basic guarantees of the Bill of Rights. Implementing the deinstitutionalization efforts mandated in these court orders will require major increases in community services for severely handicapped individuals.

Data on growth of community programs also indicate significant expansion of services for severely handicapped individuals. In a comparison of Department of Labor studies of sheltered workshops during the last ten years, Whitehead (1979) notes that while regular program sheltered workshops grew 84 percent during the decade, work activities centers, which normally serve less capable individuals, increased over 614 percent. Similar growth in non-vocational community programs for severely handicapped people is evident when the survey results of Bellamy, Sheehan, Horner, and Boles (1980) are compared with earlier studies by Cortazzo (1972) and Bergman (1976). While differences over time in the definition of activities centers and other adult day programs make precise comparisons difficult, these studies nonetheless document phenominal growth in non-vocational community services: 64 adult activity programs were identified in 1964, 422 in 1972, and 2,000 in 1980.

Community-based programs for severely handicapped adults are expanding as a result of changes in public education and deinstitutionalization policies. Therefore, the effectiveness of those policies will ultimately be judged in part on quality of community-based opportunities.

D. Importance of Work

The project was based on the assumption that the opportunity for productive, paid work is a critical aspect of quality in community services for severely handicapped adults. This focus on work opportunities is a direct application of professional and societal values that have received increasing attention throughout the last decade. These values include: (a) acceptance of normalization as a general objective in human services (Nirje, 1969); (b) emphasis on the development of personal competence (Edmonson, 1974) even when this involves exposure to some risk (Perske, 1972); and (c) the development of skills considered important by society as a whole (Roos, 1975; Gold, 1976).

Work is a normal and respected part of our society (Schrank, 1978; Ms. Magazine, 1979) and should be an option for all adult citizens. Community based programs that make severely handicapped adults totally dependent on welfare and social service programs effectively prevent participation in important aspects of normal lifestyles.

Supporting these values about work are many demonstrations that remunerative employment is possible. Research conducted over the last two decades provides convincing evidence that many severely handicapped individuals have the potential to perform meaningful work and earn non-trivial wages. The literature includes accounts of severely handicapped individuals learning such diverse jobs as the assembly of bicycle pumps (Clarke & Hermelin, 1955); bicycle brakes (Gold, 1972); oscilloscope switches (Bellamy, Peterson & Close, 1975); wiring harnesses (Hunter & Bellamy, 1977; nursery specimen cans (Karan, Eisner & Endres, 1974) ballpoint pens (Martin & Flexer, 1975); chain saw blades (O'Neill & Bellamy, 1978); agricultural gleaning (Jacobs, 1976); and use of power equipment (Crosson, 1966). Other research studies have demonstrated that, after learning vocational skills, severely handicapped individuals are often able to perform those skills at competitive rates (e.g., Bellamy, Inman & Yeates, 1978; Martin & Pallotta-Cornick, 1979; Zimmerman, Overpeck, Eisenberg & Garlick, 1969).

E. Lack of Work Opportunity

Severely handicapped people leaving public school and institution programs typically do not have vocational options, despite the wide acceptance of values supporting work and the data suggesting work is possible. Instead, they typically receive services in adult activity or educational programs where "work readiness" activities, or "prevocational training" substitute for regular, paid work.

The behavioral characteristics that have defined individuals as severely handicapped have also defined them as unfeasible for vocational rehabilitation services. Without reliable access to sheltered workshops and other vocational programs (cf. Greenleigh, 1975; Urban Institute, 1975), severely handicapped individuals have been increasingly served in programs labeled variously as activity centers, developmental centers, adult day activity programs, etc. Bellamy, Sheehan, Horner, and Boles (1980) report that there are now approximately 100,000 individuals served daily in 1,989 non-vocational community programs at a cost of 330 million dollars per year.

F. Applied Research Needs

Several knowledge development needs are apparent in the glaring discrepancy between data on the vocational potential

of severely handicapped adults and the expansion of non-vocational community programs during the last decade. Needed is applied research that provides practical information to assist in the development of work opportunities for severely handicapped adults. Research is particularly important in two areas:

(1) Evaluation of procedural details of habilitation services in community program settings. The low utilization of vocational habilitation procedures reported in the professional literature could possibly reflect problems in the external validity of previous research. Potentially important differences between typical vocational research and adult service settings include characteristics of the worker (client) group, type and availability of work to be performed, and skill of staff members implementing habilitation procedures. Consistent with Sidman's (1960) suggestions, research is now needed which systematically replicates earlier efforts in a variety of habilitation contexts.

(2) Development of program models that provide an alternative to the non-vocational adult day programs in which severely handicapped individuals typically are served. Organizational models that have evolved in services for mildly handicapped people may not be equally useful for severely handicapped persons. Further, programs that have developed in university research settings may not be directly replicable in normal service settings.

III. Project Development

The Specialized Training Program (STP) at the University of Oregon addressed these broad program development needs for three years prior to the outset of the present project. STP began as a research and service project with funding from the State of Oregon to operate an adult activity program for a group of newly deinstitutionalized adults labeled severely and profoundly retarded. The program was placed in university facilities in order to demonstrate exemplary adult services, to develop procedures for individual habilitation, and to provide a basis for practical experiences in personnel preparation.

This demonstration effort was based on several assumptions: that with structured training, severely handicapped individuals could develop competencies required for community living and vocational success; that work opportunities represented a critical aspect of community adaptation; and that direct training, structured contingency management, careful task analysis, and direct and frequent behavioral measurement represents critical features of intervention programs.

Prior to the current project, the demonstration program had produced (a) several illustrations of vocational competence, documenting the ability of severely handicapped people to learn difficult vocational skills and to perform these at remunerative rates; (b) a research monograph (Bellamy, 1976) outlining successful habilitation procedures; (c) a public information film showing the potential of severely handicapped individuals for vocational and community adaption; and (d) material that later was published as a book on vocational training procedures (Bellamy, Horner & Inman, 1979).

Experience in the university-based program supported the dual need for development of habilitation procedures and program models. The need for procedural development was evident in differential effectiveness of service efforts. Kazdin's (1973) note that the presence of a small number of failures in many behavioral intervention programs necessitated continued procedural development applied directly to our work. Phenomenal vocational progress was made by some individuals (e.g., Bellamy, Peterson & Close, 1975), but these gains were not shared by every individual served and were not achieved on every work task that was available. Research was needed to refine the techniques and increase their generality across difficult-to-serve individuals.

The need for alternative program models was also apparent in the early demonstration workshop. The program's vocational results were achieved with a staffing and organizational pattern that differed significantly from typical community programs. Such differences clearly could affect successful utilization of procedures that had been successful in the university-based program. Therefore, it appeared important to develop new organizational models in which normally available resources could be used to implement effective vocational habilitation procedures.

IV. Project Objectives and Organization

A. Project Goal

The goal of the project reflected both the broad knowledge development needs of the field and the early results of the Specialized Training Program. The project was designed to improve community-based vocational opportunities for severely handicapped adults through simultaneous development of improved habilitation procedures and a community program model in which these procedures could be used effectively.

B. Objectives

To achieve this goal the project was designed with five specific objectives:

1. Procedure Development: To develop, evaluate, and report habilitation procedures that improve community living and vocational competencies of severely handicapped adults.

2. Model Specification: To provide a comprehensive definition of a community program model for habilitation of severely handicapped adults that utilize the approach of the Specialized Training Program.

3. Instrument Development: To develop program evaluation instruments for assessing the effectiveness of habilitation services for severely handicapped adults.

4. Model Implementation: To assist three communities implement the Specialized Training Program Model to serve severely handicapped adults.

5. Model Evaluation: To evaluate the vocational and personal benefits of the Specialized Training Program Model for the severely handicapped people served.

C. Expected Results and Benefits

It was anticipated that several results and benefits would be obtained as the project worked toward and met these objectives. To assist the reader in evaluating the project, a description of these expected results is quoted from the original project proposal:

> "The research proposed here will result in thorough field evaluation of a model habilitation and education program for severely handicapped adults. Direct results of the research will be:
>
> 1. Development, evaluation and dissemination of a manual for the design and operation of a habilitation and education program for severely handicapped adults.
>
> 2. Publication of research reports on the effectiveness of various educational and training techniques with severely handicapped adults.
>
> 3. Evaluative data on the effectiveness of the STP Model for habilitation and education of severely handicapped adults.
>
> 4. Exemplary educational and habilitation services will be provided to 10-15 severely handicapped adults in each implementation site.

5. The research will develop an empirical and experimental basis for a technical assistance research implementation project of national significance in developing community services for severely handicapped adults.

Indirect results of the proposed project will be (1) provision of an empirical basis for curriculum development for severely handicapped adolescents and adults through demonstration of specific areas of skill acquisition: (2) development and refinement of program evaluation instruments which are useful measures of accountability in adult programs for the severely handicapped; (3) development of model adult training programs to interface with existing model centers serving severely handicapped children; (4) continued demonstration of the potential of severely handicapped adults for vocational success and community adaptation; and (5) provision of a vehicle for professional training in adult program management in the University of Oregon University Affiliated Facility."

D. Project Organization

The five objectives listed above provided the organizational framework for the project. Activities required to meet each objective were combined into project components or work areas. Staff assignments, task timelines, and internal management activities reflected specific investment of resources and effort in achieving each objective. Because of the scope and diversity of activities required to meet the project's six objectives, the methods and results will be presented separately for each objective in the following chapters.

Chapter 2

PROCEDURE DEVELOPMENT COMPONENT

I. Introduction and Objectives

The objective of the procedure development component was to identify and document techniques that are effective in training and maintaining vocational skills with severely handicapped individuals. Three assumptions served to guide the approach used to meet this purpose. First, the behavior of handicapped adults is controlled by the same variables as the behavior of non-handicapped individuals. Given this assumption, a procedural technology focused on retarded workers will draw heavily from the principles of human behavior currently identified in the fields of applied behavior analysis and the experimental analysis of behavior. Second, the procedures of greatest need are those which focus on current service problems. This assumption argues for studies that address both practical problems encountered in service delivery settings and results in procedures that can be implemented readily by program staff. The final assumption was that if the procedures being developed were to form a functional technology of habilitation they would need to include strategies for dealing with service "failures." The problems that have escaped resolution thus far point to the limits of the available technology, and provide a basis for evaluating procedural growth within the field of vocational habilitation.

From these assumptions, and the general objectives of the component, four operational sub-objectives were defined:

Sub-objective 1: Identify and document training procedures that allow severely handicapped to acquire vocational skill equivalent to the skills performed by non-handicapped workers.

Sub-objective 2: Identify and document production management procedures that result in severely handicapped adults maintaining and/or improving the production rate and production quality.

Sub-objective 3: Identify and document training and maintenance techniques that can be used to build appropriate non-vocational skills with severely handicapped workers.

Sub-objective 4: Identify procedural issues within work settings that will affect the use of those training and maintenance techniques described under sub-objectives 1-3.

II. Method

The methodology employed in the procedural development component strongly reflects the project's focus on performance in applied settings, performance by severely handicapped people and performance that maintains over long time periods. Methodological implications for each of these foci are described below.

A. Methodology for Applied Settings

It was felt that applied work settings are sufficiently complex stimulus environments that the development of procedures must necessarily occur within such an environment. The Specialized Training Program workshop at the University of Oregon provided such an applied setting. The workshop employed twelve (12) severely retarded workers, who spent 4-6 hours per day performing electronic sub-assembly tasks. The workshop was funded through the same channels as all day programs serving retarded citizens in Oregon. Conducting research in this applied setting ensured both an emphasis on practical problems and development of functional solutions.

B. Methodology for Severely Handicapped Workers

The focus on severely handicapped people led to an emphasis on single subject research procedures. The high response variability among severely handicapped people, the emphasis on small-group and one-to-one instruction maintained by most day programs across the country, and a need to provide a fine-grained analysis of acquisition and performance behaviors led to the selection of a single-subject research approach. The utility of single-subject research procedures has been demonstrated for several decades in experimental settings (Ferster & Skinner, 1957; Skinner, 1953; Journal of The Experimental Analysis of Behavior, 1957-1978). In addition, the past ten years have witnessed extensive use of single-subject procedures to assess intervention programs in such applied settings as psychiatric hospitals (Ayllon & Azrin, 1965), classrooms (O'Leary & Drabman, 1971; Solnick, Rincover & Paterson, 1977; Walker & Buckley, 1972) sheltered workshops (Bellamy, Inman & Yeates, 1978; Horner, 1977; Horner & Bellamy, 1978; Zimmerman, Stuckey, Garlick & Miller, 1969), and residential treatment centers (Phillips, 1968). Advocates of single-subject designs have emphasized the power, parsimony and flexibility of this methodological approach (Baer, 1977; Baer, Wolf & Risley, 1968; Hersen & Barlow, 1976; Kazdin, 1973; Parsonsor & Baer, 1973; Sidman, 1960). Final selection of single-subject procedures was based upon the following considerations:

1. The objective of single-subject research. The object of single-subject research is to identify functional relationships between those variables manipulated by the experimenter (independent variables) and change in the performance of a

subject's behavior (dependent variable). Such a relationship exists when the researcher can reliably predict a subject's performance variation, i.e., when fluctuation of a dependent variable can be reliably predicted by knowledge of independent variable manipulation. Single-subject designs allow for assessment of both, whether a subject's behavior changed, and whether the change was functionally related to independent variable manipulation.

2. The process of single-subject research. All single-subject research designs require that subject behavior be operationally defined, and a reliable system of data collection established. This data collection system is then used to determine baseline levels of the targeted behavior(s). After sufficient baseline data has been collected, manipulation of the independent variable begins. Continued data collection allows evaluation of whether the subject's behavior changed following the manipulation. To determine if a perceived change in behavior is functionally related to independent variable manipulation, single-subject designs typically require additional phases (or subjects to control for threats to internal validity (Campbell & Stanley, 1963). The type and order in which these additional phases (or subjects) are added create the spectrum of single-subject designs that are available. Kratochwill (1978) has recently detailed the characteristics, strengths and weaknesses of no less than six classes of single-subject designs.

3. Data analysis in single-subject research. The data collected from single-subject research is typically displayed in graphic form. This provides the reader with the same data used by an author in developing his or her conclusions. Assessment of the data can be performed through visual analysis (Baer, 1977), through statistical analysis (Jones, Vaught & Weinrott, 1977), or via a combination of the two (Jones, Weinrott & Vaught, 1978; White, 1974). Parsonson and Baer (1978) have provided a compelling arguement for analysis of single-subject research via visual inspection of the graphed data. They note no less than 10 criteria for assessing the existence of functional relationships: (a) within phase variability, (b) between phase variability, (c) change in slope within phases, (d) change in slope between adjacent phases, (e) stability of baseline, (f) overlap between scores of adjacent phases, (g) number of data points in each phase, (h) change in level of the overall pattern of the data. To date we have found this mode of data analysis particularly useful in identifying functional relationships in our research with severely retarded adults (Bellamy, Peterson & Close, 1975; Bellamy, Oliver & Oliver, 1977; Bellamy, Inman & Yeates, 1978; Horner, 1977; Horner, Lahren, Schwartz, O'Neill & Hunter, 1979; Horner & Bellamy, 1978; O'Neill & Bellamy, 1978; Prill, 1977; Rose, 1977).

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4. Validity in single-subject research. To the extent any research approach provides useful information, it must be able to demonstrate that (a) subject variability is more likely to be related to independent variable manipulation than to random or capricious events in the environment, and (b) that the performance of the research subjects is representative of other subjects in the targeted population. The first concern is typically identified as "internal validity," the second as "external validity."

(a) Internal validity. Campbell and Stanley (1963) have identified eight potential threats to the internal validity of a research study: history, maturation, testing, instrumentation, statistical regression, selection bias, experimental mortality and selection-maturation interaction. Kratochwill has added instability as yet another threat. Each of these threats to internal validity is minimized via the use of single-subject reversal, multiple baseline and changing criterion designs. Kratochwill (1978) outlined in detail the importance of design selection in controlling internal validity in single-subject designs. Pechacek (1978) has reached similar conclusions through the use of a probability model. In general, Pechacek argues that both reversal and multiple baseline designs allow for high levels of internal validity. In other words, these single-subject designs provide a most adequate method of assessing experimental control.

(b) External validity. Research is seldom conducted to identify the behavioral characteristics only of those individuals acting as subjects. The objective is typically to describe broader relationships that will be applicable to other members of the target population, and in settings other than the research settings. If the results from a study allow those types of extrapolation, they have a high degree of external validity. Many factors, however, threaten the degree to which results will be externally valid, (i.e., be representative of other subjects and settings). Among them are insufficient independent variable description, multiple intervention interference, Hawthorne effects, novelty effects, experimenter effects, pretest sensitization, posttest sensitization, history by treatment interactions, precision of dependent variable measurement, and time by treatment interactions (Kratochwill, 1978). The majority of these threats are minimized by careful experimental procedures regardless of the design being used (i.e., the definition and measurement of experimental variables). External validity is of particular concern with single-subject designs, however, due to the fact that only one subject (or small group) is observed. It is all too possible that the idiosyncratic characteristics of a subject could function to limit the generalizability of results. This problem is addressed in single-subject research via replication of the study. Sidman (1960) has argued persusively that the ultimate test of external validity for both single-subject and group designs is replication.

He has distinguished between systematic and direct replication, and has outlined replication procedures that maximize the external validity of single-subject research findings. Sidman's analysis has been both adopted and expanded in recent texts focusing on single-subject research methodology (Hersen & Barlow, 1976; Kratochwill, 1978).

5. Advantages of single-subject methodology for studying vocational habilitation procedures. The last thirty years have witnessed an increasing use of single-subject research. The credibility of single-subject design has been tested and found acceptable. Critical issues related to the internal and external validity of results can be addressed through single-subject procedures. In general, the experimental control that makes research functional is eminently possible via the use of a single-subject approach. In addition to being a highly respected research methodology, single-subject analysis represents a particularly appropriate approach for studying the acquisition and performance of vocational skills by severely handicapped individuals. Five major advantages of single-subject approach can be identified:

(a) The Experimental Analysis of Behavior literature has used single-subject procedures extensively. The extension of the experimental research to handicapped adults and vocational tasks will occur more efficiently if there is consistency in research methodology. This effect will be particularly significant in such areas as selection and measurement of dependent variables and consistency in the standards used for interpreting results.

(b) The second advantage of single-subject research is that it allows careful focus on severely handicapped individuals. Because this population is extremely heterogenous, results obtained by averaging the performance of any group of severely handicapped individuals tends to be unrepresentative of most individuals within the group. This is expecially true of the highest and lowest functioning individuals within the group. Single-subject procedures will avoid this averaging, and allow a more precise analysis of the spectrum of issues faced when serving severely handicapped people.

(c) The third advantage of single-subject methodology is the level of detailed analysis it allows. The present project was focusedon identifying procedures that are functionally related to change in the vocational behavior of severely handicapped people. Single-subject designs allow day by day, hour by hour, minute by minute, even second by second analysis of such change. This level of analysis will be vital to the development of comprehensive technology of vocational habilitation.

(d) The fourth advantage of a single-subject approach is that most programs serving the severely handicapped are moving

toward individualized program plans. Service providers, therefore, will be focusing not on strategies for habilitating groups of people, but on strategies for individuals. These strategies will need to cope with the variability and idiosyncracies of each individual. Single-subject designs are particularly suited for coping with subject variability. As such, the single-subject approach should better enable us to distill procedural recommendations that will be directly useful for service providers.

(e) The fifth advantage of a single-subject approach stems from the extreme power and flexibility it provides. Sidman (1960) has stressed the flexibility that comes from intensive observation of individuals. This allows for analysis of the effects that multiple independent variable manipulations may have on dependent variable performance. In addition, the single-subject approach allows careful analysis over time. The immediate effects of an intervention can be separated from those effects which are enduring. This makes the single-subject methodology particularly appropriate for analyzing the long range impact of behavior change procedures.

C. Methodology Documenting Long-Termed Change

The final characteristic of our research approach was an emphasis on documenting the ability of habilitation procedures to maintain skills over long time periods. All too often severely handicapped students have been viewed as incapable of maintaining adaptive skills over time. A research approach focused on short-term measurement of change would not allow a response to this viewpoint. As such, the procedural component employed research designs that included extended intervention phases and long follow-up periods. Towards this end, the applied settings for the research, and the use of single-subject designs proved extremely useful.

III. Results

Results of the Procedure Development Component are in part reflected in the ability of severely retarded workers in Eugene, and the four replication sites, to learn complex tasks, and in part by the documentation of training and supervision procedures in research reports. Descriptions of the tasks acquired by severely handicapped workers will be provided in the Model Evaluation chapter of this report. Abstracts of the research reports generated by project staff are provided below for each of sub-objectives initially targeted by the Procedure Development Component.

A. Reports Related to Sub-objective 1

This sub-objective involved identifying and documenting training procedures that allow severely handicapped workers to acquire vocational skills equivalent to the skills performed

by non-handicapped workers. Six research reports were produced which describe training procedures:

1. Bellamy, G. T., Inman D. P., & Schwartz R. H. Vocational training and production supervision: A review of habilitation techniques for the severely and profoundly retarded. In N. Haring and D. Bricker (Eds.), Teaching the severely and profoundly handicapped, Volume 3. Columbus, Ohio: Special Press, 1979.

Abstract: This report traces the research history from 1955 indicating the ability of severely retarded people to learn vocational skills. A review of current training procedures is then provided which includes descriptions of shaping, physical priming, modeling and verbal directions as antecedent training strategies. Problems related to developing stimulus control with retarded workers are discussed, and procedures for maintaining stimulus control in production settings are described.

2. Bellamy, G. T., Oliver, P. R., and Oliver, D. D. "Operations" in vocational training for the severely retarded. In C. Cleland, J. Schwartz and L. Talkington (Eds.) Research with the profoundly retarded, Volume 3. Austin, Texas: The Western Research Conference, 1978.

Abstract: An "operation" is a set of responsive characteristics which have a common functional effect and which are under the stimulus control of specific features of a task or setting. This report describes training procedures used with three severely handicapped students in a state institution to teach the operation "match to sample." Four separate vocational discriminations were assessed with each subject. Subjects received training on individual discriminations following a multiple baseline format. Results indicate (a) subjects acquired target discriminations following training and (b) two of the three subjects learned a match to sample operation that allowed them to perform successfully on un-trained discriminations.

3. Horner, R. H., & Bellamy, G. T. A conceptual analysis of vocational training with severely retarded adults. In M. Snell (Ed.) Systematic instruction of the moderately, severely and profoundly handicapped. Columbus, Ohio: Charles E. Merrill, 1978.

Abstract: A model for vocational training is presented which describes the use of task analysis, operant shaping and reinforcement procedures to build vocational skills with retarded workers. The report recommends specific sequencing procedures for training skills that will be useful across more than just the tasks used during training. Implications of this training model for vocational training, task analysis and prevocational programming are discussed.

4. Horner, R. H., & Prill, N. The effects of immediate correction on the error rate of one severely retarded worker. In R. Horner & G. T. Bellamy (Eds.) Habilitation of severely and profoundly retarded adults: Volume III, Center on Human Development, University of Oregon, Eugene, Oregon, 1980.

Abstract: This report documents the performance of one severely retarded woman over 100 work days. The effect of immediate versus delayed feedback on her accuracy and rate of performance is evaluated via an ABAB reversal design. Results strongly support the improvement of rate with immediate feedback, and marginally support the improvement of errors with immediate feedback.

5. O'Neill, C. & Bellamy, G. T. Evaluation of a procedure for teaching saw chain assembly to a severely retarded woman. Mental Retardation, 1978, 16, 37-41.

Abstract: O'Neill and Bellamy describe in detail the training procedures used with one profoundly retarded woman to each assembly of a chain saw blade. The task was divided into three components and the training procedures applied in a multiple baseline fashion to each component. Results indicate that the subject did learn the task and that the training procedures were functionally related to acquisition.

6. Prill, N. M. Evaluation of a procedure for teaching generalized tool use skills to a severely retarded person. In G. Bellamy, R. Horner and D. Inman (Eds.) Habilitation of severely and profoundly retarded adults: Volume II, Center on Human Development, University of Oregon, Eugene, Oregon, 1977.

Abstract: Prill describes the procedures used to train a severely retarded male to use a socket wrench. The unique aspect of this report is the focus on training the skill so that un-trained tasks were performed successfully. Implications for vocational training in school settings are discussed.

B. Reports Related to Sub-objective 2

This sub-objective involved identifying and documenting production management procedures that result in severely handicapped adults maintaining and/or improving their production rate and production quality. Nine research reports were prepared over the period of support which describe general and specific procedures that production supervision staff should use:

1. Bellamy, G. T., Inman, D. P. & Yeates, J. Workshop supervision: Evaluation of a procedure for production management with the severely retarded. Mental Retardation. 1978, 16, 317-319.

Abstract: Work rates of three severely retarded adults assembling a cable harness were studied over an 18-month period. Supervision contingencies involving differential reinforcement of higher production rates resulted in increases in production rate and decreases in variability in comparison with ongoing supervision procedures that involved partial immediate payment (token reinforcement) for work, contingent supervisor contact for task appropriate work behavior and immediate quality control. The degree of improvement of two of the three subjects was considered ecologically significant on the basis of productivity levels reached and maintenance of those levels.

2. Horner, R. H. & Bellamy G. T. Stimulus control within operant chains: Variables affecting the vocational performance of a severely retarded woman. In R. Horner & G. Bellamy (Eds.) Habilitation of severely and profoundly retarded adults: Volume III. Center on Human Development, University of Oregon, Eugene, Oregon, 1980.

Abstract: Horner and Bellamy present a 10 phase, multiple reversal design which analyzes the performance of one retarded woman assembling heat shields. Rate of shield completion and rate of several irrelevant behavior served as the dependent measure. Independent measures included immediacy of reinforcement, retraining and supervisor presence. The results indicate: (a) Increasing worker productivity via improved reinforcement management can result in a decrease in most irrelevant behavior. (b) This decrease will not occur if the irrelevant behavior is under stimulus control of task-relevant responses. In this situation retraining is required. (c) The subject responded differentially to supervisors depending on the prior reinforcement history with the supervisor. (4) Once an irrelevant response was eliminated it did not reappear. If the response was only reduced in frequency, however, it was likely reoccur following intervention.

3. Horner, R. H. & Bellamy, G. T. The effect of reinforcement schedule on the intra-chain response patterns of three severely retarded workers. In R. Horner & G. Bellamy (Eds.) Habilitation of severely and profoundly retarded adults: Volume III. Center on Human Development, University of Oregon, Eugene, Oregon, 1980.

Abstract: The report examines the performance rates of three severely retarded adults performing small sub-assembly tasks. Edible reinforcers are provided under six schedules for each worker: Chain FR60, Tandem FR60, Chain FR30, Tandem FR30, Chain FR10, Tandem FR10. Under chain schedules the workers could observe how close they were to completion of the schedule. Under Tandem schedule this feedback was not available. Results indicate that regardless of the schedule size the last few units were performed faster than other units if the worker knew s/he had feedback that reinforcement was near. This effect did not

occur under Tandem schedules. Implications for managing work environments are discussed.

4. Horner, R. H., Lahren, B., Schwartz, T. P., O'Neill, C. T. and Hunter, J. D. Considerations in dealing with low production rates of severely retarded workers. AAESPH Review, 1979, 4(2), 202-212.

Abstract: Three studies are reported for improving production rate with severely retarded workers. Study I employs an ABAB reversal design to demonstrate that differential reinforcement of high rates of performance (DRH) was an effective intervention to improve productivity. Study 2 describes the utility of retraining a worker who was making errors, and working slowly. The retraining procedure was effective in improving rate and decreasing errors. Study 3 presents an ABAB reversal design with minutes per production unit as the dependent variable and self-delivery versus staff delivery of tokens as the independent variable. Results indicate faster, more stable, performance by a severely retarded man, when he self-delivered tokens. Together these studies outline three useful strategies for improving the production performance of severely retarded workers.

5. Horner, R. H., Wuerch, B. B. & Boomer, J. D. The intra-chain response patterns of three severely retarded adults during extinction. American Journal of Mental Deficiency, in press.

Abstract: The intra-chain performance patterns of three severely retarded adults are analyzed under continuous reinforcement and extinction schedules. The three subjects performed a nine step operant chain which required the placement of eight electrical components in a circuit board blank. The time to perform the entire chain, and the time taken at each step of the chain were electronically monitored. A combined multiple baseline, ABA reversal design was used. Reinforcers were delivered following completion of the chain during A phases and no reinforcement was delivered during the B phase. Data indicate that overall chain performance was slower during extinction, and this effect was due primarily to reduced response speed in those steps early in the chain. Implications of these data for vocational habilitation of retarded adults are discussed.

6. Irvin, L. K. & Bellamy, G. T. Long-term retention of vocational skill training by severely retarded individuals. In T. Bellamy, R. Horner & D. Inman (Eds.), Habilitation of severely & profoundly retarded adults: Reports from the specialized training program. Volume II. Research and Training Center on Mental Retardation, University of Oregon, Eugene, Oregon, 1977.

Abstract: Thirty severely retarded adults were randomly assigned to three groups. Each group was trained to perform a simple vocational task using one training strategy.

The three strategies were (a) relevant dimension cue-disparity, (b) color coding/fading and (c) combined. One year following initial acquisition subjects were retrained on the same task. Results indicate much more rapid acquisition during the second training phase than occurred on initial training, hence, subjects retained information acquired one year earlier. No differences were found between training strategies.

7. Rumble, N., Inman, D. P. & Horner, R. H. The effect of contingent praise on the work rate of a severely retarded adult. In R. Horner & G. Bellamy (Eds.) Habilitation of severely and profoundly retarded adults: Volume III. Center on Human Development, University of Oregon, Eugene, Oregon, 1980.

Abstract: Three dependent variables, minutes per unit, percent time on-task, and duration of on-task responses, were monitored across on 80 work days, ABAB reversal design. During A phases the subject received social praise if she was observed on-task for one second. During B phases supervisors required five consecutive seconds of on-task behavior before delivering praise. Results indicate functional relationship between delayed praise and (a) increased productivity (b) increased percent time on-task and (c) longer duration of on-task behavior. Implications for production supervisor behavior are discussed.

8. Schwallie, E. J. & Horner, R. H. Production management: The effects of a task rotation strategy on the productivity of three severely retarded workers. Community Services Forum, 1980, 1(2), 5-8.

Abstract: The production rate of three severely retarded workers was observed under two production conditions: (a) when they worked on a single, target task during the entire six hour work day and (b) when the target task was rotated with other tasks during the day. A multiple baseline across subjects was used to measure the effects of task rotation. Results confirm a functional relationship between improved productivity and use of task rotation strategy. Implications of work allocation procedures with retarded adults are discussed.

9. Wuerch, B. B. Increasing the productivity of a profoundly retarded sheltered workshop employee. In R. Horner & G. Bellamy (Eds.) Habilitation of severely and profoundly retarded adults: Volume III. Center on Human Development, University of Oregon, Eugene, Oregon, 1980.

Abstract: The average units per minute of a severely retarded worker were monitored over a 170 work day period. An ABCBC reversal design was used to access immediate versus delayed reinforcer delivery on production rate. Immediate delivery of the reinforce (access to a radio) demonstrated improved production performance, but the improvement was not judged to be of vocational significance.

C. Reports Related to Sub-objective 3

This sub-objective involved identifying and documenting training and maintenance techniques that can be used to build appropriate non-vocational skills with severely handicapped workers. Two research reports were completed which focused on the development of community living skills.

1. Horner, R. H. Stimulus control, transfer and maintenance of upright walking posture with a severely retarded adult. American Journal of Mental Deficiency, in press.

Abstract: The report describes a method of obtaining stimulus control of upright walking posture, and examines the effects that varying antecedent and consequent variables in a training setting have on upright posture in a transfer setting. Results indicate that improved posture in the transfer setting was functionally related to manipulation of training setting variables. Maintenance of posture gains in the transfer setting was excellent across a six-month follow-up phase.

2. Rose, H. E. Effectiveness and generalization of overcorrection procedures with the stereotyped behavior of a severely retarded adult. AAESPH REVIEW, 1979, 4(2), 196-201.

Abstract: A 38-year-old severely retarded woman who exhibited high rates of self-stimulation was exposed to an overcorrection procedure during the morning break in a sheltered workshop. Rates of self-stimulation behaviors were monitored during these breaks and in three other settings. The treatment, implemented in an ABAB design, appeared functionally related to significant reduction in the behavior in the treatment setting. The experimental design also indicates a functional relationship between treatment conditions in one setting and changes in behavior rates in two other nontreatment settings. The results are of particular relevance to programs in which limited staff resources effectively prevent intervention in all situations. The data also emphasize the need for evaluation of program effectiveness on the basis of behavior change in nontreatment settings.

D. Reports Related to Sub-objective 4

This sub-objective involved identifying procedural issues within work settings that will affect the use of those training and maintenance techinques described above. Five reports were prepared under the project which addressed organizational, procedural and legal issues that affect the use of training procedures in the work settings.

1. Bellamy, G. T., Inman, D. P. & Horner, R. H. Design of vocational habilitation services for the severely retarded: The specialized training program model. In L. A. Hamerlynck (Ed.)

Behavioral systems for the developmentally disabled: New York. Brunner/Mazel, 1979.

Abstract: The report describes a combining of training and maintenance procedures into a model of vocational programs to severely handicapped people. Procedures for developing stimulus control in training and production settings are reviewed and their relationship to a comprehensive service model discussed under the following headings: Organizational structure, Work flow system, Individual treatment plans, and Management data system.

2. Bellamy G. T. & Irvin, L. K. Habilitation of the severely and profoundly retarded: An applied research perspective. In C. Cleland, J. Schwartz and L. Talkinton (Eds.) Research with the profoundly retarded. Austin, Texas: The Western Research Conference, 1976.

Abstract: This report describes research methodology related to developing and evaluating model procedures for vocational training of severely handicapped people. The report examines characteristics in work environments that may have an impact on acquisition time and worker productivity. Three classes of characteristics are discussed: (a) Setting characteristics, (b) Task characteristics and (c) Worker characteristics. It is concluded that training procedures in applied settings must reflect the demands provided by each set of characteristics. The recommendation is made that research focus be guided by the needs experienced in applied settings.

3. Bellamy, G. T. & Irvin, L. K. Utility of an instrument for assessing labels used to describe retarded adults. In T. Bellamy, R. Horner, & D. Inman (Eds.) Habilitation of severely and profoundly retarded adults: Reports from the specialized training program. Volume II. Research and Training Center on Mental Retardation, University of Oregon, Eugene, Oregon, 1977.

Abstract: The Becker Adjective Checklist was used by residential caretakers to assess moderately and severely retarded adults. Factor and score stability analyses were performed using measures derived from a sample and practical system for scoring. Results suggested that the instrument may be a useful tool for evaluating labeling behaviors of important others in the lives of retarded persons.

4. Boles S. M. & Boomer, J. D. Information processing for habilitation. In R. Horner & G. Bellamy (Eds.) Habilitation of severely and profoundly retarded adults: Volume III. Center on Human Development, University of Oregon, Eugene, Oregon, 1980

Abstract: Boles and Boomer describe the information system used in the STP model to provide programmatic information on workshop and individual client production performance. Specific features of the system are detailed with respect to: (a) users of the information, (b) input sources and procedures, (c) output reports and (d) a system summary which reports the flexibility and costs of the system. The report provides a clear description of the information system used with the STP model, and raises pertinent concerns for information management across any service delivery system.

5. Horner, R. H. Accountability in habilitation of the severely retarded: The issue of informed consent. AAESPH Review, 1979, 4(1), 24-35.

Abstract: Normalization and deinstitutionalization trends indicate that retarded adults are going to be returning to or staying in their local communities. The current emphasis on accountability suggests that the educational, recreational, and vocational programs designed to meet the needs of retarded adults must comply with legal, social, and ethical requirements. One such requirement is informed consent. In this paper a legal analysis of informed consent is presented, and implications of this analysis for retarded adults in community settings are outlined.

IV. Summary

The overall objective of the Procedure Development Component was to identify and document techniques that are effective in training and maintaining vocational skills with severely handicapped individuals. This objective was met through twenty-two reports which provide a detailed analysis of the training and maintenance issues encountered in applied service settings. Six reports on vocational training procedures have documented the ability of severely handicapped workers to acquire complex vocational skills. These reports form the core of a recently published text describing a complete technology for training severely retarded workers (Bellamy, Horner, and Inman, 1979). Nine studies were conducted under grant support which focus on production supervision strategies. In many cases these reports provide the first systematic analysis of intervention techniques that supervisors can use with severely retarded workers.

The two reports focused on non-vocational skills provide examples not only of service techniques, but emphasize the use of a vocational service model as the core for developing non-vocational skills. The final five reports emphasize the importance of integrating individual habilitation procedures into comprehensive service models. Payne and Bellamy (in press) emphasize the role of service models as mechanisms for system

change. They describe the distinct separation between procedure development, model development and model implementation. The procedures developed under the present project not only provide individual validation of habilitation techniques, but also serve as the foundation of the service model described in the following chapters.

Chapter 3

MODEL SPECIFICATION COMPONENT

I. Introduction and Objectives

The objectives of the Model Specification Component were to document, test and revise a comprehensive model for providing vocational services to severely handicapped people. These objectives build directly from the more restricted focus of the Procedural Development Component. The training and production techniques found useful in research studies were to be combined with the ongoing demands of day-to-day service delivery to form a complete model that service providers could adopt. This approach was followed in part because a variety of procedure demonstrations have been available to service providers for over two decades, without being adopted, and in part because the critical outcome measures in vocational services (i.e., wages) require that several interacting service components be simultaneously available.

A comprehensive service model has been long needed to help implement research results. For over two decades it has been documented that severely handicapped individuals can acquire and perform complex vocational skills. Very seldom, however, has the technology that produced these results left the research arena. A major reason for this has the unwillingness of researchers to extend their research results into logistically feasible service strategies. A purpose of the Model Specification Component was to ensure that products of the Procedural Development Component were made maximally assessible to service providers.

A second reason for emphasizing a model approach is the nature of service delivery outcomes. A program which provides vocational training and employment for severely handicapped people will be necessarily evaluated at some point on such variables as (a) the number and type of vocational skills that workers have acquired, (b) the amount of money that workers have generated, and take home, (c) the extent to which wages improve a worker's quality of life, and (d) the non-vocational skills acquired by workers. These outcomes are seldom the product of a single program variable. Training skills, for example, has frequently been a major focus of attention with programs serving the severely handicapped. Yet while a training technology is a clear prerequisite for skill acquisition, this technology must be combined with appropriate staffing patterns, contract procurement, and internal production operation procedures before a severely handicapped person would be able to use the training to generate income. The STP approach has been to identify all components of a facility that affect the major service outcomes and to build a comprehensive service model which specifies systems for successfully performing each of these critical components. The Model Specification activity had three sub-objectives:

Sub-objective 1: Operationally define the critical components of the STP model.

Sub-objective 2: Develop an operations manual which describes these components.

Sub-objective 3: Use the manual with facilities replicating the STP model and revise the manual based upon their feedback.

II. Method

The methodology employed in the Model Specification Component reflects a commitment to applied research. All objectives were met via continued input, review and revision from personnel involved in the day-to-day tasks associated with service delivery.

A. Methodology for Sub-objective 1: Definition of Components

The initial definition of model components was obtained by observation and documentation of the staff activities performed at the STP facility in Eugene. These activities and the systems used to support them were reviewed and revised by STP staff until consensus was reached that the components accurately reflected the critical systems employed by staff.

B. Methodology for Sub-objective 2: Develop an Operations Manual

Following the initial component definition STP staff participated in writing the systems used at the Eugene facility. This initial writing effort was followed by extensive editing and revision. The product was an initial draft of the STP Operations Manual.

C. Methodology for Sub-Objective 3: Implement the Manual and Revise as Needed

As the Model Implementation Component identified facilities that were to adopt the STP model, the operations manual was used as an index of operating procedures. Technical assistance visits and directors' meetings were used to identify weaknesses in the manual and sections in need of revision. This revision and rewriting process continued throughout the funding period.

III. Results

The product of the Model Specification Component is the STP Operations Manual. The operations manual defines the organizational structure needed for successful operation of the STP Model. The manual does not describe detailed training or production supervision strategies. This information is available in a recent text book (Bellamy, Horner & Inman, 1979). A topical outline of the manual is provided below:

STP Operations Manual

Section 1: Introduction
- 1.1 Purpose of the manual
  - 1.1.1 How the manual is to be used. Who it is written for.
  - 1.1.2 The organization of the manual. Ongoing revision
- 1.2 The STP Model
  - 1.2.1 The values and objectives of the STP Model
  - 1.2.2 History of the Model's development
  - 1.2.3 Standardization of service procedures and the use of standardized models to effect system change.
- 1.3 An introduction of the manual's content

Section 2: Management and Finance
- 2.1 External Management
  - 2.1.1 Planning
    - 2.1.1.1 Establish agency mission
    - 2.1.1.2 Establish personnel policies
    - 2.1.1.3 Establish behavior management policies
    - 2.1.1.4 Establish admission and termination policies
    - 2.1.1.5 Establish informed consent policies
    - 2.1.1.6 Approval/review of long range plans
  - 2.1.2 Organizing
    - 2.1.2.1 Organizational corporate status (IRS and state corporation laws and by-laws)
    - 2.1.2.2 Review and approve annual plans
    - 2.1.2.3 Board structure -- optional
  - 2.1.3 Staffing
    - 2.1.3.1 Defining director's job
    - 2.1.3.2 Recruit and hire director
    - 2.1.3.3 Director training
  - 2.1.4 Supervising
    - 2.1.4.1 Supervise director
    - 2.1.4.2 Director development
  - 2.1.5 Controlling (decision making, evaluation)
    - 2.1.5.1 Review monthly reports from director (financial, commercial, habilitation, management)
    - 2.1.5.2 Review 6-month reports
  - 2.1.6 Operating
    - 2.1.6.1 Suggestions for Boards of Directors
- 2.2 Internal Management
  - 2.2.1 Planning
    - 2.2.1.1 Prepare annual agency plan (compilation of fiscal, commercial and habilitation)
    - 2.2.1.2 Monthly report to external manager
  - 2.2.2 Organizing

2.2.2.1 Define staff and consultant roles: job descriptions, staff scheduling
2.2.2.2 Obtain facility
2.2.2.3 Obtain equipment

2.2.3 Staff
2.2.3.1 Recruit and hire staff and consultants
2.2.3.2 Train

2.2.4 Supervise
2.2.4.1 Staff meeting
2.2.4.2 Performance feedback
2.2.4.3 Staff development

2.2.5 Control
2.2.5.1 Compare weekly production report with plan
2.2.5.2 Compare weekly habilitation status/ report with plan
2.2.5.4 Compare monthly fiscal status/report with plan

2.2.6 Operating
2.2.6.1 Public information activities: Community, professional associations, service agencies, funders
2.2.6.2 Maintenance of records
2.2.6.3 Public posting of graphs or other displays of shop indicators
2.2.6.4 Grant preparation as needed
2.2.6.5 Implement agency policies

2.3 Fiscal Management

2.3.1 Planning
2.3.1.1 Set up chart of accounts
2.3.1.2 Forecast revenue and expenses
2.3.1.3 Prepare annual budget

2.3.2 Organizing
2.3.2.1 Set up internal financial paper and equipment

2.3.3 Supervising
2.3.3.1 Review budget monthly

2.3.4 Control
2.3.4.1 Review budget monthly
2.3.4.2 Review cash flow projections
2.3.4.3 Review balance sheet and operating statements

2.3.5 Operating
2.3.5.1 Enter cash receipts
2.3.5.2 Enter expenditures
2.3.5.3 Produce reports
2.3.5.4 Maintain records
2.3.5.5 Annual audit

Section 3: Commercial Operations

3.1 Market Analysis and Plan
3.1.1 Analyze shop capabilities

- 3.1.2 Analyze market options
- 3.1.3 Identify specialization areas
- 3.1.4 Project type and capacity of work
- 3.1.5 Prepare annual market plan

3.2 Sales
- 3.2.1 Develop sales force
- 3.2.2 Advertisement
- 3.2.3 Sales tactics
- 3.2.4 Sales document
- 3.2.5 Negotiate bids, close sales

3.3 Contract Design, Bidding and Set-up
- 3.3.1 Contract analysis of design and direct labor
- 3.3.2 Contract analysis of other direct costs
- 3.3.3 Bid computation: Prevailing wage, appropriate overhead, profit
- 3.3.4 Work floor design and job set-up
- 3.3.5 Fixture development
- 3.3.6 Other pre-production functions

3.4 The Lead Shop Model

3.5 Work Allocation and Schedule
- 3.5.1 Identify and rank production demands
- 3.5.2 Define constraints (workers, tools, etc.)
- 3.5.3 Define system rules for allocation
- 3.5.4 Allocate and schedule work (to workers, the shops, to auxiliary workers)
- 3.5.5 Daily adjustments

3.6 Inventory/Shipping and Receiving
- 3.6.1 Requisition of supplies
- 3.6.2 Receiving supplies and materials
- 3.6.3 Storage
- 3.6.4 In-process distribution
- 3.6.5 Finished goods inventory
- 3.6.6 Packaging
- 3.6.7 Shipping procedures

3.7 Quality Control
- 3.7.1 Determine standards
- 3.7.2 Define specifications
- 3.7.3 Determine procedures for each task
- 3.7.4 Supervisor training
- 3.7.5 Control process
- 3.7.6 Feedback to staff

3.8 Production Supervision
- 3.8.1 Managing workers
- 3.8.2 Managing downtime
- 3.8.3 Safety

3.9 Contract Maintenance
- 3.9.1 Relationship to sales (or transfer of contract from sales)
- 3.9.2 Customer relations
- 3.9.3 Coordination with secondary shops
- 3.9.4 Contract expansion
- 3.9.5 Loss of sales

3.10 Production Information
- 3.10.1 Set up display and print files
- 3.10.2 Make assignments
- 3.10.3 Enter daily data
- 3.10.4 Enter cost data
- 3.10.5 Begin a day or month
- 3.10.6 Get reports and perform analyses
- 3.10.7 Report scheduling
- 3.10.8 Graphing and public display

3.11 Production Coordination (day-to-day)
- 3.11.1 Worker/task schedules/allocation
- 3.11.2 Coordinate auxiliary workforce
- 3.11.3 Develop feedback to staff
- 3.11.4 Daily set-up
- 3.11.5 Decision rules and "red flags" used in managing the production operations
- 3.11.6 Checklists for staff performance

Section 4: Training and Habilitation

4.1 Introduction
- 4.1.1 Purpose
- 4.1.2 Overview of process (flow chart)

4.2 Individual Habilitation Plans
- 4.2.1 Purpose and function of the plan (include frequency)
- 4.2.2 Assessment (needs and opportunities)
- 4.2.3 IHP development
  - 4.2.3.1 Preparing for the meeting
  - 4.2.3.2 Persons present
    - 4.2.3.2.1 Advocate/guardian
    - 4.2.3.2.2 Person or family
    - 4.2.3.2.3 Other agencies
    - 4.2.3.2.4 Shop staff
  - 4.2.3.3 Agenda
  - 4.2.3.4 IHP form

4.3 Training and Program Intervention (Implementing the IHP)
- 4.3.1 Introduction
  - 4.3.1.1 Training (Vocational and community living) and behavior interventions (production rate and behaviors)

4.3.2 Vocational Training
- 4.3.2.1 Introduction
- 4.3.2.2 Task analysis
- 4.3.2.3 Individual training procedures
- 4.3.2.4 Data collection and evaluation

4.3.3 Behavior Change
- 4.3.3.1 Introduction
- 4.3.3.2 Design program
- 4.3.3.3 Implement
- 4.3.3.4 Data collection and evaluation

4.3.4 Community Training
- 4.3.4.1 Introduction
- 4.3.4.2 Design TA (could be TA, flow chart, target behavior)
- 4.3.4.3 Training

4.3.5 Production Behavior
- 4.3.5.1 Introduction
- 4.3.5.2 Design program
- 4.3.5.3 Implement
- 4.3.5.4 Data collection and evaluation

4.4 IHP Files

4.5 IHP Evaluation and Monitoring
- 4.5.1 Introduction
- 4.5.2 Levels of Evaluation
  - 4.5.2.1 Program implementor
  - 4.5.2.2 Program coordinator
  - 4.5.2.3 IHP committee

4.6 Supervision and Care
- 4.6.1 Introduction
- 4.6.2 Defining supervision needs

IV. Summary

The model specification integrated procedural research results with practical program management needs to form a comprehensive guide for operating vocational services for severely handicapped individuals. The model differs from traditional workshop organizations in its emphasis on direct service, rather than support service staff; in its specialization with respect to extended employment rather than combining employment with placement training services; and in it's focus on wages as a critical outcome of services. The operations manual was developed in coordination with directors of all programs using the model, and has been continuously refined as procedure improvements emerged in the programs.

Chapter 4

INSTRUMENT DEVELOPMENT COMPONENT

I. Introduction and Objective

The instrument development component was included in the project because of a paucity of evaluation tools that could be used to assess progress of severely handicapped adults in the Specialized Training Program model. If the STP model affiliate sites reached their objectives, the lives of individual participants might be expected to change in several ways: They should develop vocational skills; they should earn wages performing those skills; they might be perceived differently by caretakers or family members as a result of improved vocational competence; and their behavior in non-work settings might also undergo changes.

To assess such predicted and possible effects of the model, the instrument development component was designed to develop valid, reliable instruments to assess the work performance and quality of life of STP workers. This chapter describes the evaluation of six instruments that were developed or adapted for program evaluation purposes. Included are information on reliability, content and concurrent validity, procedures for data collection, and current impressions of the feasibility for use in future evaluation efforts.

II. Methods and Results (By Instrument)

This section describes the development and technical properties of six instruments which can be utilized or adapted for evaluation research with severely retarded adults. The instruments are:

1. NOLE: Naturalistic Observation of Living/Leisure Environments (Crowell, Weissman-Frisch, Lamson, & Boomer, 1980)

2. ABS: Adaptive Behavior Scale (Nihria, 1969)

3. Becker Adjective Checklist (Becker, 1960; Bellamy & Irvin, 1977)

4. TILE: Telephone Interview of Living / Leisure environments (Weissman-Frisch, Crowell, Bellamy, & Bostwick, 1980)

5. Supervisor's Checklist

6. Fidelity of Implementation Checklist

Three of these instruments -- NOLE, TILE, and the Supervisor's Checklist -- were newly developed for the project. The Becker Adjective Checklist was factor analyzed on a sample of 604 retarded adults, by Bellamy and Irvin (1977). Some of these factor scores were used in the quality of life evaluation. Technical properties of these subscales are reported. Similarly, Nihira's (1969, 1976) factor analyses of the Adaptive Behavior Scale were used as a basis for determining subscales in the evaluation. TILE and the Supervisor's Checklist were developed too late for use in the evaluation effort; however a reasonable amount of technical information is now available. Table 4.1 reports the current status of each instrument.

Table 4.1 Current Status of Evaluation Instruments Developed and/or utilized by STP

INSTRUMENT	STATUS		
	Pilot version developed & field tested	Final version developed	Technical properties reported
Natural Observation of Living Environment (NOLE)	X	X	X
Becker Adjustive Checklist- Adapted for Severely Handicapped	X	X	X
Adaptive Behavior Scale*	*	*	*
Telephone Interview of Living Environments (TILE)	X	X	
Supervisor's Checklist	X		
Fidelity of Implementation Rating Form	X		

*Developed by Nihira (1969). Additional psychometric information collected by STP

A. NOLE: Naturalistic Observation of Living/Leisure Environments

The naturalistic Observation of Living/Leisure Environments (NOLE) instrument is a 29-category, 10 second, fixed interval observation code. It was designed to provide data on the social and environmental interactions of clients during leisure-time activities in their living facility. The 29 categories were selected to provide descriptions of behavioral change in the three broad areas of "attention," "physical contact", and "social contact." Each behavioral event is recorded within one of five

activity settings in the group home, family setting or institution: dining, recreational, single component work setting, multi-component work setting, and transitional break setting.

NOLE observations were made at four-month intervals on a total of 42 subjects for a 15-minute period on each of three consecutive days. The 45 mintues of observation were recorded during unstructured leisure time periods. During one 5-minute period for each subject during each 45 minute observation sequence, two observers recorded observations in order to obtain an estimate of observer agreement. NOLE precedures are described in detail in the NOLE training manual (Crowell, Weissman-Frisch, Lamson & Boomer, 1980).

Three NOLE composites were selected on the basis of their relevance to assessment of social growth: Total Social Interactions (TS) Social Initiation (SI) and Total Deviant (TD):

> Total Social (TS) behavior rates are based upon nine NOLE categories: staff-initiated social interactions (directive, supportive, or general); peer initiated interactions (directive, supportive, or general); and subject-initiated interactions to either a staff member of a peer (directive, supportive or general). These categories were combined to index the general level of social interaction between the subject and his or her environment.
>
> Social Initiation (SI) consisted of all interactions initiated by the worker, to either peers or staff.
>
> Total Deviant (TD) behavior rates are based upon three NOLE categories stereotypical behavior, aggressive behavior and non-compliant behavior. These categories were selected on the basis of their presumed negative influence and participation on social and community life. Since the stereotypical behaviors could be double coded with other categories, the total deviant rate was divided by two, yielding a maximum rate of 6.0 "TD" responses per minute.

1. Reliablilty. Three types of reliability indices were calculated: interobserver, internal consistency (split-half) and temporal stability.

a. Interobserver agreement was assessed for each NOLE category throughout the course of data collection. Mean percentage of agreements, averaged over sites and occasions, were 69 percent for Total Deviant, 74 percent for Subject-Initiated Social contacts and 77 percent for Total Social behaviors. Mean intraclass correlations were .92 for Total Social, .91 for Total Deviant, and .95 for Social Interaction. These indices

denote the type of moderate interobserver agreement typical of complex naturalistic observational systems. (cf. Jones, Reid & Patterson, 1974).

b. Internal consistency was assessed by split-half procedure. Composite scores for the first 22.5 minutes of observations were correlated with scores on the second segment of 22.5 minutes for 17 workers at the Reno and Spokane sites. Spearman Brown corrected correlations were .83(Total Deviant), .84 (Total Social) and .89 (Social Initiation).

c. Temporal stability was assessed using a variant of the classic test-retest approach. These data were collected from 11 potential clients in Spokane before the STP intervention was initiated. Each worker was observed for the standard 45 minutes. The procedure was repeated 4 months later. Table 4.2 presents means, standard deviations and "test-retest" correlations. All correlations are significant beyone the .05 level and in the high moderate range, r=.61 to .78. There is a very little fluctuation in either the mean or standard deviation for the two social measures, and there is only a slight drop in the mean score for Total Deviance. The time span (4 months) though appreciably longer than the 2 to 4 weeks recommended by APA (1974), still seems within reasonable limits.

Table 4.2 Means, Standards Deviations and Test-Retest Correlations Spokane Site Over a Four Month Interval (N=11)

VARIABLE	FIRST OBSERVATION(O_1)		SECOND OBSERVATION(O_2)		
NOLE	$\bar{X}$	SD	$\bar{X}$	SD	r_{tt}
Total Social (TS)	.99	.84	1.01	.84	.61
Social Initiation(SI)	.53	.54	.59	.68	.78
Total Deviant (TD)	1.00	.80	.73	.64	.71
ADAPTIVE BEHAVIOR SCALE					
Independence(ABS_{12})	106.09	19.3	105.91	21.9	.93
Social Responsibility (ABS_3)	40.91	12.45	38.36	12.9	.77
Maladaptive Behavior (ABS_{45})	34.18	30.13	42.55	35.97	.83
BECKER ADJECTIVE CHECKLIST					
Perceived Competence (B_1)	32.45	7.69	31.55	14.5	.84
Perceived Sociability (B_3)	3.18	8.87	1.65	9.09	.82

2. Discussion. The NOLE appears to be reasonably sensitive high fidelity narrow bandwidth instrument (Cronbach, 1970), covering a representative sample of unstructured leisure situations. While this instrument provides important information for research and development efforts, its utility for ongoing program evaluation purposes would be limited by the cost of travel and direct behavior observation.

B. Becker Adjective Checklist

The Becker Adjective Checklist (BAC) instrument is a 47-item bipolar adjective rating device designed to assess how important others (i.e., parents, caretaker staff at group home facilities) label the behaviors of clients in relations to others with similar disabilities. The instrument was originally used by Becker (1960) to assess attitudes of parents towards children with behavior problems, Bellamy and Irvin (1977) factor analyzed the results when this instrument was completed by caregivers of 604 institutionalized retarded individuals at a state hospital. Five orthogonal factors emerged. The factors were quite similar to those found in Patterson and Fagot's (1967) factor analysis of ratings by a group of parents of children with behavior disorders. The factors found in the Bellamy and Irvin study were: Withdrawn, Disruptive, Tense, Non-Compliant, and Incompenent. In the current study, only two factors were used: "Withdrawn" and "Incompetent." The reliabilities of the other 3 subscales did not seem adequate.

The Becker Adjective Checklist was used to assess any fluctuations in the labeling behavior of the staff at the living facilities. The work of Mercer (1973) and others has led us to believe that how people are perceived and labeled can have a strong effect on how others interact with them, regardless of current functioning level. Thus it seems worthwhile to explore how severely handicapped people are labeled. It is important to stress that the Becker Adjective Checklist was used to assess staff labeling behavior not client behavior.

To strengthen this impression, the names of the factor scores used in the evaluation were changed to Perceived Sociability (B_1) and Perceived Competence (B_3). It also seemed wise to emphasize the positive rather than negative aspects of these dimensions, and so that the scores would be consistent with the new definitions, linear transformations were performed on the original Bellamy and Irvin (1978) scoring rules.[1]

1. BAC data collection procedures. The BAC was completed by primary caregivers of each participant in STP replication site at four month intervals. Instruments, complete with written instructions, were distributed to caregivers by site staff and collected during visits by NOLE observers to the residence.

[1] $B_1=17-B_1-$, $B_3=22-B_3$ where B_1- and B_3- are the original Bellamy & Irvin, (1978) formulae, and B_3 and B_1 the new scores.

2. Reliability estimates. Internal consistency was assessed for the evaluation sample using coefficient alpha at both pretest (first observation) and posttest (next to last observation 20 months later). Results are reported in Table 4.3. Even though the evaluation sample was different than the standardization sample (community-based rather than institutionalized), high internal consistency indices are still found (range of .77 to .88; median=.85). Thus the factor scores seem fairly stable and consistent indicator elements of staff perceptions across 2 very different living situations.

Table 4.3 Internal Consistency (Coefficient Alpha) Estimates for Empirically Derived Subscales of Becker Adjective Checklist

Subscale	State Institution (N=214)	Pretest All STP Workers Involved in Evaluation	Pretest STP Evaluation Sample
Perceived Competence (B_1)		.77	.94
Perceived Disruptive (B_2)		.88	.89
Perceived Social (B_3)		.83	.79
Perceived Tense (B_4)		.85	.83
Perceived Non Compliant (B_5)		.87	.83

Temporal stability was estimated by test-retest correlations in several different ways. The "purest" measures of test-retest reliability are the Spokane measures for Perceived Competence and Perceived Sociability. (see Table 4.4) These were taken over a 4 month period for subjects not undergoing treatment. Both measures show high correlations (r=.82, .84 respectively), with no elevation or decrease in mean scores on either variable.

Table 4.4 Reliability (Temporal Stability) Estimates for Empirically Derived Subscales of Becker Adjective Checklist

	Spokane STP Site [a] (N=11)	All STP Sites [b] (N=24)	State[c] Institution (N=24)
Perceived Competence (B_1)	.82	.65	.65
Perceived Disruptive (B_2)	---	.29	.78
Perceived Social (B_3)	.84	.74	.54
Perceived Tense (B_4)	---	.12	.64
Perceived Non Compliant (B_5)	---	.79	.60

[a] Over a 4 month interval, no treatment

[b] Over a 4 month interval, most subjects in treatment

[c] Over a 12 month interval, no treatment

Unfortunately test-retest measures for the other factor (those not used in this evaluation) are not so easy to interpret. Correlations were taken between BAC factor scores for all subjects assessed during both the first observation (O_1) and the second observation (O_2) 4 months later. Of this group two-thirds were undergoing fairly intensive training at STP sites. Results are reported in Table 4.4.

Reliabilities are reasonable for B_3 (Perceived social) and B_5 (Non-compliance), but unacceptably low for B_2 (Disruptive) and B_4 (Tense). For this reason these variables were dropped from the evaluation. An attempt to form a composite B_{25} (Perceived Inappropriate Behavior) led to equally low reliability coefficients. The correlations cited in Table 4.4 may well be underestimates since two-thirds of the STP clients were undergoing treatments, and correlations may be confounded by differential treatment effects. The correlations cited from the institution sample are consistently in the moderate range. These too may be underestimates since the interval between administrations was 12 months rather than the recommended 2 to 4 weeks. Thus, for the B_2, B_4, and B_5 subscales we are really unsure of the temporal stability. A future test-retest study within APA ranges (of 2 to 4 weeks) using subjects not in treatment is recommended.

3. Discussion. At present our view of the continued utility of the Becker Adjective Checklist for program evaluation purposes is decidedly mixed. The orthogonal factor structure elucidated by Bellamy & Irvin (1977) on a sample of institutionalized retarded adults appears to be equally valid for retarded adults in a community setting. Furthermore, the factors are quite similar to those found by Patterson and Fagot (1967) with a sample of children with behavior problems, perhaps supporting Passini and Norman's (1966) assertion that basic factor structures remain stable across populations and instruments.

Test-retest information is a bit more scanty and inconclusive. Two factor scores, Perceived Sociability (B_1) and Perceived Competence (B_3), have consistently moderate to high test-retest reliabilities. Perceived Non-Compliance (B_5) appears reasonably stable too, though we lack sufficient information to make a definitive statement. Disruptive (B_2) and Tense (B_4) demonstrated exceedingly low, non-significant test-retest correlations (.29 and .12 respectively) in our study, though the Bellamy and Irvin (1977) figures were quite high (.78 and .64). Our low figures may be due, in part, to differential treatment effects, since two-thirds of the sample was receiving training at this time. The attempt to combine factor scores into composites resulted in very low reliabilities, and is definitely not recommended.

Even more troubling to us than the technical (reliability) issues with the BAC are programmatic and ethical problems with its use. The Checklist is clearly intended to measure changes in caretaker's perceptions of client behavior not changes in

client behavior itself. Early work by Becker (1960) clearly demonstrated that changes in target child's behavior did not correlate strongly with changes in adult perception of that behavior. In all likelihood the same will be true for our population. Even though we have tried to clarify this issue for consumers by relabeling the subscales Perceived Competence, etc., there is a human tendency to regard anything with numbers with undue reverence. Thus, we fear that small alterations in scores on Perceived Competence or Perceived Tenseness be treated as an indicator of real social growth or decline on the client's part, rather than as slight changes in a caretaker's perceptions. We thus urge that the Becker Checklist be used with caution, only as a measure of staff behavior, and only as a supplement to a series of other measures.

C. Adaptive Behavior Scale

The Adaptive Behavior Scale (ABS) is a widely used rating scale containing a number of behavioral domains. The finding of several factor analytic studies (Nirhira, 1969, 1976; Lambert and Nicoll, 1976) suggested the use of five ABS factor scores: Personal Self-Sufficiency (ABS_1); Community Self-Sufficiency (ABS_2); Personal-Social Responsibility (ABS_3) Social Maladaptive (ABS_4); and Intra-Personal Maladaptive (ABS_5). These five factors were combined into three composites:

ABS_{12}: Self-Sufficiency

ABS_3: Social Responsibility

ABS_{45}: Maladaptive Behavior

1. ABS data collection procedures. The procedures for the ABS ratings were identical to those specified above for the BAC. In the event that primary caretakers were not able to complete the rating form independently, they were assisted by a person trained to elicit responses by interview techniques.

2. Reliability. Inter-rater reliabilities for domain scores on the ABS range from .93 (Physical Development) to .71 (Self-Direction) with a mean of .86 (Nihira, 1976). These appear to be, for the most, above acceptable standards for a rating scale.

Internal consistency was estimated on our evaluation sample at both pre and post-test. Coefficient alpha was calculated using each domain score as an "item," and composite scores as total scores. Table 4.5 reports the results. The ABS_{12} composite has quite high reliability; ABS_3 is in the moderate range. The ABS_{45} composite shows moderate internal consistency at the pretest, but is much too low at posttest. We doubt the wisdom of using this as a composite in the future and feel that using individual scale scores for ABS_4 (Social Maladaptive) and ABS_5 (Intra-Personal Maladaptive) makes more sense. Test-retest correlations for the composites, reported in Table 4.2 are .93 for ABS_{12}, .77 for ABS_3, .83 for ABS_{45}. These are reasonable for subscales.

Table 4.5 Internal Consistency (Coefficient Alpha) Estimate for Adaptive Behavior Scale (N=21)

Composite Name	Pretest	20 months later	Posttest
Self-Sufficiency (ABS_{12})	.87		.87
Social Responsibility (ABS_3)	.82		.72
Maladjustment (ABS_{45})	.78		.60

3. Discussion. The ABS seems a reasonably reliable instrument. Except for ABS_{45} all subscales reliability coefficients are in the moderate range (.72 to .95). One advantage to using the ABS is that it is a widely known instrument, and many empirical studies have used it. However, there are several problems we have encountered with the scales. Even though they are in wide use, no normative data is available, or will be in the near future. (Nihira, personal communication.) Thus, as with the Becker Adjective Checklist, one must use a comparison group in order to use this in a rigorous program evaluation.

A more serious problem is the extreme length of the instrument. Many of the group home staff were unhappy about having to spend so much time, once every 4 months, filling out the form for each client. We are uncertain that the information garnered from the ABS would be worth the time required to get it in nonexperimental evaluation contexts.

Finally, it is a little unclear what type of information the ABS gives. It seems to fall erratically somewhere between the Becker Adjective Checklist (a measure of staff perception) and the NOLE (a measure of actual client behavior). Some items are reasonably "objective," e.g., those dealing with self-help skills; other terribly "subjective," e.g., those dealing with emotional issues. It seems that in future evaluations, the ABS should be used sparingly, perhaps once a year, and serve as a supplemental measure only.

D. Concurrent Validy of ABS, BAC, and NOLE

Our estimates of concurrent validity are at best crude. Ideally, validity studies would be run prior to the evaluation; however, due to the novelty of the instruments this was impossible. To estimate concurrent validity our composites/subscales were divided into three constructs.

1. Those dealing with Independent Functioning/Competence (ABS_{12}, B_3).

2. Those dealing with Social Behavior (ABS_3, B_1, and the Total Social (TS) and Social Initiation (SI), Composites from NOLE).

3. Those dealing with Maladaptive Behavior (Total Deviant [TD] from NOLE, ABS_{45}).

Correlations matrices were obtained for each of these categories for the first observation (pretest) and the next-to-last observation, 20 months later (posttest)[2]. Table 4.6 reports these correlations.

These constructs are merely approximations. We expected moderate, but not terrible high correlations between the instruments, since in a very basic sense, they are assessing somewhat different things: the NOLE observed client behavior, the ABS inferred behavior, and the BAC the perceptions and labels applied by the staff to clients. In addition, we predicted that pretest intercorrelations might be higher than posttest intercorrelations because of differential treatment effects.

With this in mind, the validity coefficients seem promising. The two independence/competence measures show a high correlation (.90) pretest, and a lower, but still significant correlation of .47 at posttest.

The social measures are also quite high at pretest. For the posttest, NOLE Total Social correlates highly with all variables; it is always higher than the Social Initiation category of the NOLE -- which makes sense, considering the relatively low focus on initiation in the ABS and BAC. The high correlation between Total Social and Social Initiation is largely an artifact of the NOLE scoring system. However, the reasonably high BAC correlations (.77, .79, at pretest) are promising. As expected, the ABS correlations are even higher: .86 with Total Social and .79 with the Becker subscale.

It is only for the construct of inappropriate behavior that the results are seriously low, a correlation of .3. Several explanations come to mind. The most salient seems to be the fact that for this population it is often very low base rate incidents such as severe tantrums, violent outbursts that cause people to be judged deviant or problemmatic. The occurence of these incidents is reported in the ABS, but they may not have occurred during the generally non-stressful 45 minutes of leisure time during which the clients were observed for the NOLE. Another technical problem, the relatively low reliability of the ABS_{45} composite, probably served to attenuate the correlation. It seems that the NOLE Total Deviant Score, the ABS_4 and ABS_5 subscales, but not the ABS_{45} composite might still be quite reasonable assessment instruments.

[2]Sample size was low for the last observation due to several facility changes. See Chapter 6.

E. TILE Instrument

The Telephone Interview on Living/Leisure Environments (TILE) is a structured interview technique in which program staff or parents respond to interviewer questions during telephone conversations of 10-15 minutes duration. The TILE questions were generated through a process of involving group home staff and STP staff in the design activities. Procedures and items were revised following several pilot tests of the TILE interview with parents and group home staff. TILE users are provided data on the special and temporal distribution of activities of clients at home and in the community.

The TILE form enables the interviewer to record three types of data: (1) descriptive data on the client, the interviewee and the residence; (2) checklist data on the frequency of client behaviors during the 24 hours preceeding the call; and (3) checklist data on the frequency of client behavior/activities during the week preceeding the call.

1. Reliability and agreement procedures. Agreement data were collected to check two potential sources of error with the instrument: That interviewee's answers might not reflect actual events, and that records kept by interviewers might not reflect reported events. To assess interviewee agreement TILE calls were placed to a second interviewee at each facility, using the same procedures employed with primary interviewees. Interviewer agreement was assessed with a second interviewer recording interviewee responses during a TILE interview, while listening to the call on an extension phone. For each resident agreement checks with second interviewees and with second interviewers were scheduled for one of the four TILE calls. Agreement percentages for each TILE composite were computed by dividing the number of agreements by the number of agreements plus disagreements and multiplying the result times 100. As shown in Table 4.7, the percentages range from 96 to 100 for interviewers, and from 67 to 90 for interviewees. Split-half reliability estimates for each composite range from .71 to .92. Concurrent validity coefficients produced by the same study resulted from correlations between ABS factors and TILE composites, as shown in Table 4.8.

2. Concurrent validity. The concurrent validity of TILE data was assessed by comparing composite scores with results of Adaptive Behavior Scale ratings and with general ratings of satisfaction. For this comparison, five scores were derived from the ABS results, based on factor analyses by Nihira (1969) and Lambert and Nicoll (1976). Given the composite descriptors, it was anticipated that significant correlation coefficients would be obtained between the independence composite and ABS_1 (personal self-sufficiency), between the social behavior composite and ABS_3 (personal-social responsibility), and between the negative behavior

Table 4.6
Concurrent Validity Estimates

Construct \ Observation		Pretest				Posttest				
Independent Functioning			B_3	ABS_{12}			B_3	ABS_{12}		
	B_3(Perceived Competence)		1			B_3	1			
	ABS_{12}(Autonomy)		.90	1		ABS_{12}	.47	1		
Social Behavior		TS	SI	B_1	ABS_3		TS	SI	B_1	ABS_3
	TS(Total Social, NOLE)	1				TS	1			
	SI(Social Initiations, NOLE)	.99	1			SI	.93	1		
	B_1(Perceived Sociability)	.77	.77	1		B_1	.85	.84	1	
	ABS_3(Social Responsibility)	.86	.85	.79	1	ABS_3	.78	.67	.62	1
Deviant Behavior			TD	ABS_{45}			TD	ABS_{45}		
	TD(Total Deviant, NOLE)		1			TD	1			
	ABS_{45}(Maladaptive)		.30	1		ABS_{45}	.33	1		

Table 4.7
Reliability Data for TILE Composites

TILE Composites

Reliability Descriptors	Negative Behavior		Independent Behavior		Social Behavior		Programming Decisions
Split-half Coefficient	** .71		** .84		** .92		** .88
	24 hr.	week	24 hr.	week	24 hr.	week	week
Percent Agreement							
Interviewer	96	99	98	98	100	98	99
Interviewee	81	90	81	85	67	83	88

** significant at .01

Table 4.8

Validity Coefficients for TILE Composites and ABS Factors, and TILE Intercorrelation Coefficients

	ABS Factors					TILE Composites		
TILE Composites	Personal Self-Sufficiency	Community Self-Sufficiency	Personal-Social Responsibility	Interpersonal Adjustment	Intrapersonal Adjustment	Independent Behavior	Social Behavior	Negative Behavior
Independent Behavior	.44*	.31	.21	-.11	-.10		.28	.11
Social Behavior	.38*	.45*	.43*	-.16	-.35			.09
Negative Behavior	-.39*	-.24	-.43*	.49**	.76**			

*p = <.05

**p = >.01

composite and ABS_4 (interpersonal adjustment) and ABS_5 (intra-personal adjustment). As is apparent in Table 4.9, all the predicted correlations between TILE composites and ABS factors were significant at the .05 level. Further, the low correlations among the TILE composites and between TILE composites and unrelated ABS factors suggest that the independent behavior, social behavior, and negative behavior composites reflect different aspects of subject performance.

F. Supervisor's Checklist

The Supervisor Checklist is a rating scale designed to provide data on client vocational and work-related behavior as perceived by a trainer or staff supervisor. The Checklist was developed in the absence of existing scales able to provide performance-based data on vocational activities of moderate and severely retarded workers.

The basis for item generation was the listing of domains by Palmer (1974) on the basis of his factor analysis of ratings of over 1,000 mildly retarded adults in Sweden. Palmer's categories were adapted to suit the needs of severely retarded clientele and the nature of training in behaviorally-based programs.

1. Reliability and concurrent validity. Coefficient alpha internal consistency was .95 for a sample of 160 workers at 20 different service programs in Oregon (Approximately 40 percent in institutions and 60 percent in community facilities).

Concurrent validity was assessed by correlating total scores with the client's score on the Trainee Performance sample (Irvin, Gersten, Bellamy, Taylor, & Close, (1980), a measure of rate of acquisition of vocational tasks. Correlations were performed at the site level. The median correlation was .76.

The data from the field-testing was then factor analyzed. Three orthogonal factors emerged: (a) Skill Acquisition and Performance; (b) Dependence of Performance on External Environment; and (c) Social Behavior. It was discovered that the test had too few items in the social domain. This past year, the wording of the items was reviewed by a group of practitioners and 8 work activity center directors in Oregon were interviewed to inquire about the suitability of the rating form for their clients and to indicate any important areas that were omitted. Currently, a revised version of this checklist, incorporating the feedback from the interviews is being prepared.

G. Fidelity of Implementation Checklist

An evaluation tool critical to continued model implementation, but less useful in broader evaluation contexts, is the model implementation checklist. The pilot draft of the checklist was

developed during the final project year to assess the extent to which program components defined in the STP Operations Manual are indeed present in implementation sites. Technical data on the implementation checklist are not now available.

III Summary

Six instruments of potential use for evaluation of programs for severely handicapped individuals were developed by the project:

1. Naturalistic Observation of Living Environments (NOLE)
2. Becker Adjective Checklist -- Factor Scores
3. Adaptive Behavior Scale -- Factor Scores
4. Telephone Interview of Living Environments (TILE)
5. Supervisor's Checklist
6. Implementation Checklist

The first four are in sophisticated levels of development. The technical characteristics, internal consistency, temporal stability, interobservation agreement, and concurrent validity, have been described in detail. On the whole, they seem reasonably high for instruments in the realm of social behavior/ quality of life assessment. The major difficulty with the NOLE, as with other direct observation systems, is the high cost of assessment. For this reason, the more cost-efficient TILE was constructed. Our tentative recommendation is that for many evaluation efforts, the TILE will provide reasonably accurate information at a far less expensive price. For fine-grained analysis of social interactions, the NOLE would be necessary. Both instruments appear to possess reasonable technical characteristics.

The two checklists pose more problems. The factor scores on the Becker Adjective Checklist were used to assess alterations in staff labeling behavior, not in client behavior. Mercer (1973), among others, has emphasized that it is important to measure how supervisors or teachers or caretakers label their clients, because often the client's label rather than the client's actual behavior influences how s/he is treated. For this reason, the BAC would be useful. Another advantage to this instrument is that it is easily and quickly filled out. We have encountered several disadvantages. On the technical side, while the Perceived Competence and Perceived Social subscales demonstrate consistently high reliabilities across several samples, we are less sure about the other 3 subscales: Tense, Disruptive, and Withdrawn. Further work is needed in this area. Another problem encountered with the BAC during a pilot study was that staff members at one workshop initially refused to fill out the form, because they did not

describe their clients in terms of trait psychology, and did not find it profitable to do so. With the increasing number of behavioral approaches to training being used in the field, this may become more of an issue in the future.

The Adaptive Behavior Scale is a well-known, commonly used instrument. The technical properties seemed reasonably sound for our sample of severely handicapped clients with one exception. The composite score ABS_{45} (Inappropriate) had much lower reliabilities than the other scales. In the future, we believe the two Inappropriate scales, ABS_4 and ABS_5 should remain separate. Our major concern with the ABS is that it is neither a low inference direct measure of client behavior, as with the NOLE, nor a high inference measure of staff perception, as with the Becker Adjective Checklist. It appears to be a reasonable supplementary instrument. However, one must take into account how long it takes to complete the form. We would not recommend asking staff to use the ABS more than once a year.

Chapter 5

MODEL IMPLEMENTATION COMPONENT

I. Introduction and Objective

The model implementation component provided the project's unique link between a university-based demonstration program and community services of three states. The objectives of the component were: (a) to establish three ongoing community-based programs which utilized the Specialized Training Program Model; and (b) to provide a set of diverse community programs in which the STP Model could be evaluated and improved. Accomplishing these objectives involved a coordinated set of activities with each site, progressing from initial establishment of model implementation sites to selection and training of staff, selection of severely handicapped participants, program assistance, business assistance, and finally gradual removal of support from the university-based project.

II. Methods

Although each of the replication sites presented unique problems and support needs, the process of model implementation became more streamlined and refined with each succeeding site. What follows is an account of the general implementation procedures and objectives as they evolved during the project, rather than a detailed description of project activities related to any single site. Included in the account are descriptive data on the implementation sites and business activities.

A. Establishment of Implementation Sites

Site establishment involved identifying and planning with new or existing organizations that expressed an interest in the Specialized Training Program Model. Successful establishment involved reconciling the often divergent interests of the project staff, the local program staff or board, and one or more state agencies that regulated or funded the services provided by the staff. Although the original proposal underestimated both the complexity and cost of these activities, the high level of interest in the model on the part of education, developmental disabilities, and vocational rehabilitation agencies in some states greatly facilitated establishment efforts.

1. Planning. The establishment planning process began when either a community program or state agency expressed interest in the model, and ended when the program actually began using model procedures to serve workers. The planning process generally

occured in four phases. The first involved effort to develop an understanding of exactly what the STP Model was, and to clarify differences between the model and more traditional habilitation programs. Through this process it was expected that informed statements of interest in the model would be received from state and local agencies. Project activities in this phase included: (1) distribution of project products, including research reports, model descriptions, a newsletter, and a film on the program that had been produced under previous funding; (2) conducting tours of the demonstration project at the University of Oregon; (3) providing week-long inservice training experiences (with separate funding from the Regional Developmental Disabilities Office) to over 100 community service providers; (4) visiting local programs interested in the model; (5) meeting with agency boards of directors to discuss implications of using the STP model; (6) participating in state policy planning related to adult services; and (7) speaking at local, state, and regional meetings of relevant professional and advisory groups. Statements of interest in implementing the model with request for assistance for the project were received from programs in fourteen western states.

The second step in the planning process was to evaluate the feasibility of model implementation in each interested program. Criteria for evaluation were derived from research on adoption of innovation (e.g. Fairweather, 1979), and included the following:

(a) Characteristics of the facility or organization (e.g., commitment of serving severely handicapped people in the community; commitment to normalization as a service philosophy; commitment to long-term employment as a meaningful service objective for handicapped adults; financial stability of the organization; presence of positive relationships with cooperating agencies; availability of physical space that can look and function as a subcontract work environment; current staff skills and staffing patterns; commitment to public dissemination of data; level of autonomy that the model program can anticipate; commitment of the organization to adapt the unique characteristics of the model).

(b) Service needs (e.g., presence in the community of severely handicapped adults who need services; availability of appropriate housing and transportaiton for participants).

(c) Business opportunities (e.g., availability of benchwork contracts from the local economy; existing contract tasks in the organization).

(d) Program funding (e.g., availability of establishment funds; availability of long-term operating funds; cash-flow projections).

A total of six programs within budgeted traveling distance of the University of Oregon were judged by the staff to be potential sites based on these criteria.

2. Establishment assistance. Each program considered to be a potential site received assistance to plan and organize for model implementation. Project activities involved assistance in preparation of funding proposals to state agencies; development of letters of agreement specifying the interaction between the university project and service programs; assistance in organizing existing programs to include the model; and help in specifying program location, name, policies, and staffing needs.

The original proposal targeted the establishment of three sites. Four programs of the six considered feasible completed the establishment process and implemented the STP model: Olympus, in Seattle, Washington; Alpha Production Technologies, Inc., in Reno, Nevada; Benchworks, in Spokane, Washington; and Dynatron, in Bend, Oregon. Neither of the two remaining sites considered feasible (Lancaster, California; and Phoenix, Arizona, received state funding for program operation. However, the Lancaster program was funded after the end of this project and is currently implementing the model).

Of the four sites, two are divisions of existing community programs and two are free standing facilities; two are in urban areas and two in relatively small towns; and all are located in buildings separate from other service programs in locations near other businesses and light industries. Each program was expected to serve about 15 severely handicapped workers, and each approximated this total by gradually adding participants throughout the first year.

B. Selection and Training of Staff

STP staff participated in constructing and circulating job announcements and in the hiring of the program director. When selecting program staff, consideration was given to the following characteristics:

1. Experience with, and commitment to handicapped people.
2. Knowledge of and experience using behavior management strategies.
3. Administrative experience.
4. Demonstrated ability to operate independently.
5. Ability to collect and use data in making program decisions.
6. Experience developing and managing individual program plans.

7. Business experience: fiscal management, business organization.

8. Experience in sales and production operations.

9. A willingness to be a key person in an ongoing work environment.

10. Professional goals and objectives that were consistent with those of the organization.

1. Director's training. A six-week on-campus training program for site directors was developed to provide both an orientation to the STP model and the skills necessary to use it. The program focused on:

(a) Direct service skills. This component included didatic and practical training related to vocational training, behavior management, task analysis, community-based training, program data collection, and other techniques and procedures which are important in education and habilitation of severely handicapped people.

(b) Business skills. This aspect of the training program dealt with the issues of industrial sales, contract bidding, production engineering, operations management, and customer maintenance activities which are critical to operation of a community program as a business. This aspect of the training assumed special importance as recruitment efforts identified very few individuals with interests and experience in both model services for severely handicapped individuals and subcontract operations management.

(c) Agency management skills. Management of not-for-profit community agencies require skills in program budgeting, grant preparation, and personnel and resource management, as well as knowledge of a variety of public agency regulations and operating procedures. These areas, as included in this aspect of the training program.

A total of six individuals participated in the director's training program.

2. Staff training. Each staff member of each site participated in a one-week inservice at the University of Oregon within the first few weeks of employment. This training experience was designed to provide an overview of the philosophy and structure of the model and to develop skills in direct services to severely handicapped people. An overview of content is presented in Table 5.1

Table 5.1

In-Service Content for Site Staff

Schedule In-Service Units	Method of Instruction	Unit Outcomes
I. Day One A. Pretests		
B. Writing Behavioral Objectives	Didactic, modeling, practice with feedback	Fianl behavioral objective which includes: 1) condition under which behavior is to be performed, 2) the behavior, 3) the criterion to which the behavior is to be performed
C. Behavioral Observation	Didactic, modeling, practice with feedback (observation in STP Work Activity Center)	Reliability Index of at least 85%
D. Task Analysis	Didactic, modeling, practice with feedback	Final Task Analysis which includes: 1) sequenced steps 2) cues for each step, 3) criterion for each step
II. Day Two A. Introduction to Training	Didactic, video taped training models	Worksheets on training procedures
B. Difficult Steps Training	Didactic, modeling	Written identification of difficult discriminations and manipulations/and remediating training strategies
C. Simulated Training	Modeling, practice with feedback	Training another participant on a task using four specific training techniques
III. Day Three and Four A. Training (3 participants each day)	Modeling, practice with feedback	Use of specified training techniques at an accuracy level of at least 85%
B. Production Planning (3 participants each day)	Didactic, observe shop	Written identification of two instances of production planning in STP Shop
C. Production Supervision	Modeling, practice with feedback	Use of specified production supervision techniques at an accuracy level of at least 85%
IV. Day Five A. Ethics	Didactic	
B. Film		
C. Posttests		
D. Feedback to participants, Feedback from participants	Discussion	

C. Selection and Admission of Severely Handicapped Participants

Each of the four replication sites began implementing the STP model with 2-5 severely handicapped workers, and gradually increased to the targeted total of 15. Admission policies for each program specified that participants must: (a) be diagnosed as severely or profoundly retarded, on the basis of current IQ scores below 40; (b) be currently excluded from all vocational programs; (c) be free of major motor disabilities affecting the hands and arms, and (d) be 18 years of age or older. Referrals were accepted from developmental disabilities caseworkers, vocational rehabilitation counselors, residential institutions, and public schools. Participants were selected without known bias from these referrals. Demographic characteristics of participants are detailed in Chapter 6.

D. Program Assistance

Assistance to implementation sites was designed both to help in model implementation and to identify aspects of the STP model itself that could be improved. Assistance was provided through regular telephone contact with each implementing site, monthly review of data for the site to identify problem areas, and visits by project staff to sites.

Assistance conversations and visits were initiated either by the site or project staff, and dealt with any aspect of program operation. Most frequent issues addressed in visits were (1) overall evaluation of model implementation during the first few months of site operation, with assistance on any problem identified; (2) assistance in teaching a new work contract to severely retarded workers; (3) assistance in management and organizational issues; and (4) help in resolving conflicts that arose with state or local agencies as a result of the unique features and goals of the STP model. Technical assistance visits were made to each site frequently during the first year of operation and were gradually eliminated thereafter, so that assistance after two years consisted primarily of telephone contacts.

E. Business Assistance

Assisting each implementation site develop the business expertise necessary to procure work that would allow severely retarded participants to earn significant wages proved to be one of the most difficult tasks of the project. Although vocational rehabilitation has funded business activities and business-related training for sheltered workshops for some time, this has had little effect on severely handicapped adults. These individuals have been either excluded individually from workshops or prevented collectively from benefitting from business opportunities in workshops because adult activity programs typically are ineligible for vocational rehabilitation grants.

Three of the four model implementation sites were funded as adult activity programs by state agencies, and thus had restricted access to business-related services typically available to workshops. Business success was minimal during the first year, and as a result, the project assumed a more significant role in business assistance than was originally planned. During the second and third years, assistance was provided to sites in the areas of contract procurement and production design. A salesperson was hired cooperatively by the project and sites to provide the needed industry laison.

F. Information Processing Assistance

During the second and third years of the project, each site received monthly computer printouts of summarizing production and behavioral data for each worker. This service was a by-product of the project's program evaluation component. It assisted sites in a variety of organizational management, reporting, and payroll tasks that would have consumed significant staff time without the project support.

III. Results

Each of the objectives of the model implementation component was achieved in full. The first, to establish three community-based programs that utilized the model, was exceeded because of the high level of support from the three participating states. A total of four model implementation sites were established. Each continued to use the model at the close of the project, and each continued as an ongoing element of local services to severely handicapped people. By the end of the project, severely handicapped people were receiving habilitation services and work opportunities in these programs.

The second objective was to improve the STP model on the basis of experience in diverse implementation sites. As is reported in detail in Chapter 3, the model was refined and supplemented in several significant ways. Further, both the process and the staff expertise for further model implementations were developed and, as anticipated in the original proposal, will be utilized in subsequent dissemination efforts.

An additional outcome of the contact with state agencies which funded or regulated implementation sites has been the development of regulations in one state and fiscal incentives in another which support the provision of work opportunities in previously non-vocational adult programs.

IV. Summary

The model implementation component assisted four community programs implement the STP model. Implementation assistance

involved determining interest and feasibility in potential sites, assisting in organizational development, training of staff, and providing technical assistance in habilitation programming, business, and information processing.

Chapter 6

PROGRAM EVALUATION COMPONENT

I. Introduction and Objectives

The program evaluation component had as its primary objective the assessment and description of the effects of the STP model on severely handicapped adults. In meeting this objective the component focused upon two major areas:

1. The acquisition of vocational skills and financial indicators of vocational success for workers employed in STP replication sites.

2. Changes in the nonvocational areas of the workers' lives, including changes in how they were perceived by those who interacted with them.

II. Methods

This section consists of two parts. The first deals with the vocational aspects of the evaluation effort while the second deals with the nonvocational aspects.

A. Vocational Evaluation

In order to ensure an accurate, reliable, and valid set of data upon which to base the evaluation of vocational changes engendered in the severely handicapped adults working in STP replication sites, project personnel developed and implemented a centralized data entry and reporting system for all sites. This system, which is described in detail elsewhere (Boles and Boomer, 1980), consists of an input form, filled out for each worker during each day. This form captured data about the class of vocational activity the worker was engaged in any given time period of a day, the particular task within that activity class, production output, error count, an indicator of supervisor assistance, and the occurrence of target behaviors unique to the individual worker. Independent studies of these items (e.g. Biel-Wuerch, 1979) using percent agreement scoring procedures yielded reliabilities greater than 90%. In addition, sites sent the project staff a form which indicated the time standards and status associated with all tasks being worked on at the site. These forms were entered into computer files by project staff, analyzed by custom designed application programs, and transformed into a set of monthly reports which were returned to the site as well as being stored in a project data base for subsequent analysis. Several types of reports were produced:

1. Activity level reports. These reports include reports which summarize the performance of all the workers at a particular site for a given class of activity. Figure 6.1 is an example of such a report for production activities at a site. It provides information for each production task as to the volume of work being done, the amount of time required for its performance, the productivity and error frequency of the workforce, the gross wages to be paid to the work force, and the amount of revenue generated by the workforce for the site.

2. Site level report. This report, shown in Figure 6.2, summarized the time distribution of the site workers by activity class as well as site productivity, gross wages, and shop generated revenue.

3. Individual reports. There were three individual reports produced by the system. The first two of these were identical with Figure 6.1 and 6.2 save for the fact that they were organized at the level of the individual worker rather than at the site level. The third report provided a day by day record of the individuals' time at the site, an indication of supervision required, percent occurrence of target behaviors, and wage/revenue data.

While the most important purpose of these reports was to provide feedback to sites regarding the consequences of their programmatic decisions, they also provideda basis for a summative evaluation of the vocational effects of the STP model. In the results section of this chapter we will provide such an evaluation by examining a database reflecting the performance of all four project sponsored replication sites during calendar year 1979. This database is constructed from monthly site reports and includes the following variables for each of 48 monthly site observations: Total commercial revenue, revenue generated by the severely handicapped adults working in the site, the total pretax wages accruing to these workers, the number of handicapped workers, the average monthly pretax wage for a worker, the total time spent by the workers in vocationally related activities, the time spent in production, the wages paid to workers for production, the average hourly wage for a worker for participation in all activities, the average hourly wage for a worker for production activities, and the average revenue generated by a worker per month. The database is an aggregate representation of 570 individual monthly reports selected from a larger database that includes sites not sponsored under this grant. (G00 760 5455) Analysis of this larger database is in progress and results will be reported elsewhere (Boles, Horner, and Bellamy, in preparation).

B. Nonvocational Evaluation Methods and Procedures

The hypothesis explored in this nonvocational portion of the evaluation effort was that serious vocational training and involvement in vocational tasks for which workers were paid wages would result in an improvement in the quality of life for adults

Figure 6.1

Activity Level Report

Report on Production Tasks for "Shop" from 781002 to 781020

Task#	Task Name	Minutes Worked	Units Made	Minutes Per Unit	Standard Minutes	Percent Standard	Errors Made	Incentives Received	Worker(s) Paid	Shop Paid
2.00	Tea-Shield	2669±	198	13.48	261	9.7%	5	$1.14	$13.62	$27.24
3.00	Battery-0028	84	19	4.42	31	36.9%	0	$ .02	$ 1.79	$ 3.59
4.10	Finish-0026	580	270	2.15	284	48.9%	0	$ .41	$15.09	$30.18
4.20	Solder-0026	1080	426	2.54	447	41.3%	0	$ .20	$23.81	$47.62
6.00	Cable-2143	3710	123	30.16	1985	53.5%	0	$1.62	$107.01	$215.25
28.00	Cam-263-1005-00	282	30	9.40	175	62.0%	0	$ .01	$10.50	$21.60
30.00	Cam Switch(.1636)	215	16	13.44	157	73.0%	0	$ .00	$10.40	$20.96
31.00	Cam	1027	155	6.63	902	87.8%	0	$ .00	$51.92	$103.85
50.00	Sprocket-Sub-Assmb	8348	2091	3.99	1485	17.7%	3	$1.62	$161.00	$321.80
50.90	Sprocket-Rework	275	400	.69	200	72.7%	0	$ .07	$ 8.80	$18.00
80.10	Fanning-Strip	150	7	21.43	56	37.3%	0	$ .03	$ 2.42	$ 4.85
	TOTALS	18420						$5.21	$406.36	$814.94

Figure 6.2

Site Level Report

Shop Report for "Shop" from 781002 to 781020

Total Minutes worked	60939
Total Incentives Received	$16.45
Workers Paid	$512.97
Shop Paid	$1,028.19
Shop Productivity	32.48%
% Time in Production	30.22%
% Time in Production Training	5.75%
% Time in Simulation	64.01%
% Time in Simulation Training	0.00%

classified as severely or profoundly retarded -- all other conditions being equal. Almost immediately, we should point out that if individuals are moved out of a community living facility and hastily moved into an institution, or if there is constant turnover at a facility, we would not expect the "spillover" effects from the vocational experience to counteract the effects of serious disruptions and deterioration in the client's immediate social living environment. Unfortunately, this was the case for a large proportion of the individuals involved in one of the STP replication sites.

The type of activity described in this section seems to fall midway between documentation and evaluation research. Documentation refers to serious, systematic collection of a set of measures from participants in an intervention project without the experimental control aspired for the evaluation research, of Cooley and Lohnes (1976) or Abt Associates (Stebbins, St. Pierre, Proper, Anderson & Cerva, 1977). Considering the ethical and practical constraints involved in selecting a no-treatment control group and the newness -- and consequent lack of established norm groups, reliability and validity estimates -- of our three dependent measures -- this seemed the only reasonable option.

The instruments used in this study are described in detail in Chapter 4. To briefly reiterate:

1. A naturalistic assessment instrument (NOLE) was used to measure the behavior of the individuals in their residential settings. Data were aggregated into three behavioral categories -- Total Social, Social Initiation, and Total Deviant.

2. Two empirically derived subscales from the Becker (1960) Adjective Checklist (BAC) were used to assess:

   (a) Perceived Competence

   (b) Perceived Social Skills

3. Three scores based on factors derived by Nihira(1976) from the Adaptive Behavior Scale were also used.

1. Hypotheses. The major hypothesis under examination was that involvement in the Specialized Training Program would improve the quality of life of the clients, as measured by the indicators discussed previously. Since there is no actual STP program component dealing with social behavior or specific programming for the maintenance of shop behavior at home, what we are exactly exploring are hypothesized "spillover" effects. With that in mind, we would more likely expect improvement in perceived competence or sociability

(on the Becker Adjective Checklist) than on the actual behavioral observations from the NOLE. ABS factor scales would seemingly fall somewhere in between these. Since vocational success is more likely to lead to increased feelings of competence and demonstrations of independence than increased social and conversational schools, our prediction was that the BAC competence and ABS Independence scales might show more change than the four social scales. Since there was an appreciable amount of program devoted to control behavior that interfered with work, some "spillover" or generalization was expected in that area. (i.e., NOLE Total Deviant and ABS Maladaptive).

We also believed that those individuals who benefited most from the training (as measured by quarterly wages and number of tasks learned) might make more gains, especially in the domains of competence and independence, than those with less success in the vocational program.

Finally, we predicted that those in the program for a long period of time (i.e., two years) would make more gains than those in for merely one year. For various reasons dealing with attrition and change in residential placement, we were unable to explore the latter issue.

2. Overview of the design and evaluation sample. A truly quasi-experimental design was used in this evaluation. This was the only available course considering the infeasibility of locating control/contrast groups (and denying service to clients), and the lack of any normative data on any of the three instruments -- the Adaptive Behavior Scale (Nihiri, personal communication), the Becker Adjective Checklist, or the newly developed observational instrument. As more evaluation and assessment work is done with this population, normative data should become available, and the use of norm-referenced comparisons (Talmadge, 1977) -- the mainstay in compensatory education evaluation designs -- will become feasible. The evolution of the ultimate design will be described in some detail in the hopes of elucidating issues of importance for further work in this area.

In order to establish some type of experimental control over the effects of maturation, reactivity, and history, we orginally attempted to utilize a modified multiple baseline design (Hersen & Barlow, 1977), with one site (Spokane) beginning services 12 months after the other two sites (Seattle and Reno). However, due to a temporary shutdown of the Seattle workshop and a major upheaval in the living quarters of the entire clientele of the Reno facility, this too, proved infeasible. The best plan appeared to be some form of time series. In accordance with this plan, all STP clients in all three sites were assessed every 4 months on all three instruments -- the Becker Adjective Checklist (BAC), the Adaptive Behavior Scale (ABS), and the naturalistic observation instrument (NOLE). The BAC and ABS were completed by the primary

caregiver (i.e., group home counselor or parent for those living with families). Clients were observed on three consecutive days for a total of 45 minutes by trained University of Oregon personnel according to NOLE procedures specified in the previous section.

Since the Becker Adjective Checklist (and to some extent the ABS) are measures of caregiver perceptions of client behavior, rather than a direct measure of client behavior, there seemed to be no meaningful way to trace patterns for clients with changes in primary caregiver or with a change in residential facility. For those cases, it would be unclear whether fluctuations were due to the differing perceptions of different staff members or systematic changes in the client. Unfortunately, over the 2 years, more than 50 percent of our clientele experienced either a change in facility, a change in primary caregiver, or both. When this is compounded with attrition, and the relatively small sample sizes, the use of a time series design also became impractical (Knapp, 1979). There were no cohesive samples of individuals who progress could be followed for periods of 12 months or more.

Thus, the only viable option was a pre-posttest design. To qualify as part of the evaluation sample, a worker needed to:

1. Be involved in an STP program for at least 12 months, and

2. Remain in the same facility (or home) for the 12 months with same primary caregiver.

These decision rules were necessary for two reasons. First, there seemed no point in examining spillover effects for those in the program for less than one year. It would be unclear whether the small changes that might be expected in one year were due to treatment effects or measurement error. Second, when the person who filled out the ABS or BAC forms (i.e., the primary caregiver) changed, we could make no inferences as to the source of changes in scores. The changes could be due to change in worker's behavior or to differing standards of different staff members.

With these criteria the sample size was reduced to 22 workers. Virtually the entire clientele of the Reno replication site were omitted because of group home staff and/or facility changes every 8 months. Of the 22 workers remaining in our sample (from the Seattle and Spokane sites), only two were engaged in STP activities for more than 16 months.

The following conventions were established for determining "pretest" and "posttest" scores from the data:

1. Pretest was the mean of all scores collected prior to treatment. If the first observation was collected simultaneously with the beginning of treatment (as was

the case of several workers in Seattle), then only the one set of scores from the first observation were considered pretest.

2. Posttest was always the mean of the last two observations while the worker was engaged in the STP program. While this probably eliminated a bit of the treatment effect, it seemed wise because of the less-than-perfect temporal stability of our measures. By averaging two observations, we were assured of getting a much more accurate picture of the clients' behavior, and others' perception of her/his behavior.

III. Results

This section covers the results obtained from evaluating the effect of the STP model upon both the vocational and nonvocational aspects of severely handicapped adults' lives in four project replication sites throughout the western United States. It is divided into three parts, the first of which describes the characteristics of the handicapped workers themselves. The second and third parts respectively report vocational and nonvocational results obtained using the model in sites serving these adults.

A. Characteristics of Workers

The four BEH replication sites served a total of 63 profoundly and/or severely retarded adults during the period covered by this report. Thirty-five of these adults were male and 28 were female. The average age (as of September, 1979) was 31 as was the average full range I.Q. Prior to entering the replication sites, 32 of these adults lived in state institutions while 23 lived with parents, three in group homes, four in foster homes, and one in a congregate care facility. By September of 1979, 18 were still in state institutions,[1] 21 lived with parents, 10 lived in group homes, two in foster homes, eight in congregate care facilities, two in nursing homes, and two lived independently. These adults had spent an average of 18 months in the sites as of September, 1979.

The nonvocational evaluation sample of 22 workers (see pg 64) was composed of 12 males and 10 females. The average age of this group was 31 and the average full range I.Q. was 29. Prior to entering the replication sites, 12 of the workers lived in state institutions and 10 lived with their families. By September, 1979, two still resided in state institutions, 12 were living in group homes, and 8 lived with parents or relatives.

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[1] Fourteen of these at one site in a state which had made a policy decision to reinstitutionalize group home residents!

B. Vocational Evaluation Results

A fair idea of the range and complexity of the tasks mastered by the severely retarded adults in replication sites may be obtained by examining Table 6.1. Each of the 42 tasks described was learned by at least one worker. Details of the task acquisition for individual workers on particular tasks are given elsewhere (Horner and Bellamy, 1980).

The impact of having mastered these complex tasks can be gauged by examining a set of outcome variables which were kept for the replication sites during calendar year 1979. These variables, described in section 6 II A, reflect the extent to which sites and individuals showed measurable changes in wage related areas or performance:

1. Worker generated revenue. During 1979, severely handicapped adults generated an average of $1,105.00 per month, per site in commercial revenue with a range of from $91.00 to $2,579.00. These figures represent the value added by the workforce to products manufactured at the sites. Overall, the severely handicapped workers generated $53,025.00 in commercial revenue which represents 85% of the total commercial revenue of all the sites. (The remaining was produced by staff and/or nonhandicapped auxilliary workers).

2. Average monthly worker wages. This variable, which shows the average monthly pretax wages paid to workers' at the site averages $43.50 for 1979. (Range $6.08 - $91.42). Given a workforce with an average I.Q. of 31, and considering that over 50% had experienced multi-year institutionalization prior to working at the replication sites, this figure compares favorably with the national average reported by the Department of Labor (1979) of $24.00 for work activity center clients.

3. Hourly wages. During 1979, sites averaged 860 hours per month of total program time (range 438-1391). This time reflected production, training, and simulation activities. Production time averaged 432 hours per month, per site (range 38-1073) or about 50% of the total time in program. Worker wages during 1979 averaged $511.00 per month per site (range $49.00 - $1,080.00). Workers averaged $.64 per hour for total time in program (range $.11 - $1.79) and $1.20 per hour for time in production (range $.77 - $2.23). As was the case with average monthly worker wages, these figures compare very favorably with national averages. For example, the Department of Labor (1979) reported that the average hourly wage for time in production for all mentally retarded clients in sheltered workshops was $.58 per hour.

Table 6.1

Descriptions of Tasks Acquired by Severely Retarded Workers in Facilities Using the STP Model

Printed Circuit Boards:

Circuit Board. A circuit board is stuffed with 15 components which are then clipped and soldered in place.

LED. 350 small light bulbs are hand soldered in place on a 28" by 2" circuit board.

Perkins Circuit Board. Over 125 components are appropriately positioned in a circuit board. The leads are clipped and soldered in place.

Circuit Board. Components are inserted into a printed circuit board using needle-nose pliers. Each lead is soldered using a hand solder station. Leads are clipped with wire cutters. Two nuts are placed on screws of one component and tightened with a nut driver.

Drake Willock PC Board. Twenty-five electrical components are placed in appropriate positions in a 3½" by 5" circuit board. The components are soldered in place and then the solder is brushed clean with a wire brush and solvent.

Wire Terminations and Assembly:

Cable Harness (Oscilloscope). Eleven color-coded, plastic coated wires are laid in sequence on a fixture. A plastic lace is tied around the end of the group of wires and individual knots are made at 5/8" spaces along the length of the cable. The wires are clipped flush to the nails on the board with wire cutters. The end of each wire is stripped to ½" using an electric rotary stripper.

High Voltage Cable. Fourteen color-coded wires are placed in sequence on a cable board between nails. Using a 4 foot long plastic lace, approximately 40 knots are tied so they are evenly spaced on the wires. The wires are cut flush (with hand held wire cutters) to the nails and the steering of each wire is stripped back 3/8" using an electric rotary stripper.

4-Wire Cable Harness. Plastic cord is cut to length using scissors. Four wires are laid out on a board in sequence. Twenty-six knots are tied with the lace so they are all evenly spaced on the wires. The cord is clipped to ½" at each end using scissors.

Table 6.1 (continued)

Descriptions of Tasks Acquired by Severely Retarded Workers in Facilities Using the STP Model

Cable. Bulk cable is cut with wire cutters in lengths from 3 to 50 feet. The cable is taped and the outer casing is stripped off with a hand held wire stripper. Plastic tubing is placed over bare wires. Terminals are machine crimped and inserted into plugs. A strain relief secures the plug to the cable. One end of the cable is tagged.

Cable. Cable parts are sorted. Bare wires are separated out from insulated wires, foil inside cable casing is removed and small wires are stripped with a hand held stripping gun.

Cable. A flat ribbon cable is cut to length and one end inserted into a plug. The plug end is placed into an apparatus which crimps the plug onto the cable. A strain relief secures the plug to the cable. A number is stamped on the plug.

Cable. Plugs are cut off cables with wire cutters. Terminals are extracted from plugs with an extractor tool. Labels are removed from plugs.

Transformer. Five electrical wires are cut to length using wire cutters. The ends are stripped to 3/8" using hand strippers. Two transformers are wire prepped by cutting 3 wires to length and stripping them. The 5 electrical wires and the 2 transformers are assembled to a metal fixture using an open end wrench and a screwdriver. Three terminals are crimped to wires using hand crimpers. The wires are tied together with plastic wire ties.

Power Supply. The rubber sleeving of a power cord is cut to length using a hand wire cutter. Insulation is removed exposing 3 wires which are cut to specified lengths. The ends of the wires are stripped using hand held strippers and terminals are crimped to the wires using a hand crimper.

Cut Wires. Ten wires are cut to varying lengths using hand wire cutters.

Grey Cord With Ferrell. A ferrell is placed over the end of an electrical outlet cord. The ferrell is pushed 6" down the end of the cord and crimped using a hand crimper mounted on a fixture.

Clark. Wires are cut to length and the ends are stripped bare with wire strippers, and terminals are crimped in place on appropriate ends.

Table 6.1 (continued)

Descriptions of Tasks Acquired by Severely Retarded Workers in Facilities Using the STP Model

Clark. Electrical wires are cut to length, the ends are stripped bare with wire strippers, and terminals are crimped in place on appropriate ends.

NCR Groundwire. 8½" long bare wires are cut with a paper cutter. Terminals are placed on the twisted wire ends and crimped in place with a hand held crimping tool.

Terminal Clip. Electrical terminals that come in long strips are separated with hand held pliers.

Desolder Terminals. The solder is removed from circuit boards with a solder gun that liquifies solder and then sucks it out.

Packaging and Preparing:

Fill Bottles and Pack. A scoop is used to fill a measure with compound. The measure is placed on a vibration table to settle the compound. Using a funnel, the measured compound is poured into a bottle and the bottle is capped. The plastic bottles are cleaned with a damp cloth and placed in boxes of 6 each. A flat cardboard box is opened and the end flaps folded in correct sequence. The box is sealed with tape from a tape dispenser.

Package TA-20. A rubber stamp and ink pad are used to stamp box with appropriate number and color. The box is opened and a completed TA-20 unit and a package of screws are placed inside. The box is closed.

Heat Sink. Two holes are drilled in an aluminum bar.

Packaging. Bottles are filled with oil and abrasive compound. An eight ounce plastic bottle is filled with mineral oil. A measured amount of abrasive compound is then placed in the bottle with the aid of a funnel. The bottle is capped, cleaned and placed in a box with five other bottles.

Primark Packaging. Flattened boxes are assembled and filled with the appropriate number of Primark plastic tape cartridges. The box is closed and a stick-on label affixed to the top. Some cartridges need to be filled with tape before being placed in the box.

Crimp. Each lead of a 2-lead electrical component is cut and bent in or out with a hand held crimping tool.

Table 6.1 (continued)

Descriptions of Tasks Acquired by Severely Retarded Workers in Facilities Using the STP Model

Vice Cut. Each lead of a 2-lead electrical component is cut at a predetermined length by inserting the component in a pair of end cutting nippers mounted on a metal fixture.

Mechanical Assembly:

Electric Microswitch Assembly. Wires are cut with wire cutters and stripped bare with hand held wire strippers. Wires are connected to a terminal which is crimped in place and then soldered.

Probe Tip. A metal part is positioned in place on a piece of plastic and glued securely with epoxy glue.

Assemble Keypad for Microswitch. Plastic key tops are sorted and then appropriately positioned in rubber base. Wire ribbon is cut to length, the ends are stripped, and the completed wire is soldered in place with a soldering iron.

TA-20 Housing. A circuit board is inserted in a plastic housing. Using a screwdriver, the base is attached to the housing with two screws. A piece of cork is placed on the base.

Housing. A circuit board is inserted in a plastic housing. A washer and nut are placed over the switch on top of the housing. A nut driver is used to tighten the nut. A metal base is attached to the housing with two screws using a screwdriver. A piece of cork is placed on the base.

Rebuild Solenoid (starters for automobiles). Parts are removed from boxes and sorted into parts bins. Wires are clipped to appropriate lengths and old solder replaced with new. Solenoid cap is assembled using a bolt and screws. A knife is used to scrape bare wires and clean off old carbon. New springs are put in position and soldered together. Springs are cut to length. Spring and leads are fit together.

C. Non Vocational Evaluation Results

The purpose of non-vocational evaluation was to explore whether, in addition to vocational gains, workers at STP sites displayed growth in aspects of their life outside the worksetting. There was no intentional programming in these domains, thus what was hoped for were spillover effects. For that reason, the magnitude of the expected effects were small.

A quasi-experimental design was utilized. Due to attrition and several unexpected changes in residential facilities, our plans to utilize a time series design were abandoned, and a modified pre-posttest design substituted. To qualify for the evaluation sample, workers must have been engaged in an STP program for at least 12 months in a stable living situation. These requirements eliminated approximately half of our sample, but seemed necessary. Because of the aforementioned factors, we were unable to evaluate the effects of 2 years of treatment; ninety percent of our sample had stable living situations for only 12 months.

With a sample size of 22, and a fairly heterogenous population, the power of statistical tests was likely to be quite low. Thus results are reported two ways: in terms of statistical significance and in terms of magnitude of effect in standard deviation units. Dependent measures were 8 subscales or composites from the Becker Adjective Checklist, Naturalistic Observation of Living Environments (NOLE) and the Adaptive Behavior Scale.

1. Effects of participating in implementation sites. Table 6.2 reports the results of the non vocational evaluation with the 8 subscales described in Chapter 4 broken down into three domains: Independence, Social Behavior, Inappropriate Behavior. The higher the scores for the Independence and Social scales, the more normative the behavior. For the two Inappropriate scales, the lower the score, the more normative the performance.

Correlated t-tests were performed on each subscale, and both the t-values and associated probabilities are reported. Though none of the probabilities reach the .05 significance level, two values are very close; Social Responsibility ($t = 1.34$; $p = .09$) and Maladaptive Behavior ($t_{(21)} = 1.59$; $p = .06$). Considering the heterogeneity and size of the sample, these results should probably be considered suggestive of treatment effects.

The magnitude of the treatment effect for each variable is expressed in standard deviation (SD) units in the extreme right column. Generally in educational evaluations, pre-post differences greater than either one-fourth standard deviation (e.g., Becker and Engelmann, 1976; House, Glass, Walker, and McLean, 1979) are considered suggestive of educationally significant differences. House et al. argue that with small heterogeneous samples, differences that meet the educational significance criterion, but are not

Table 6.2

TOTAL SAMPLE (N=22) - WITH STABLE SETTING
AND ONE YEAR OF TREATMENT: PRE-POST SCORE

	PRE		POST		t^a	p	Magnitude of Effect in SD Units
INDEPENDENCE		Sd		Sd	Sd^a		
Perceived Compentence (B3)	16.55	6.62	17.95	7.87	.95	.18	.02
Independence (ABS12)	100.72	19.65	101.5	16.65	.27	MS	.05
SOCIAL							
Total Social (NOLE)	.92	.81	.96	.84	.32	NS	.02
Social Initiation (NOLE)	.45	.47	.39	.41	.86	.20	.25
Perceived Social (B1)	35.1	6.10	36.0	7.44	.68	.25	.15
Social Responsibility (ABS3) b	41.3	9.64	43.5	7.87	1.34	.09	.25
INAPPROPRIATE							
Total Deviant (NOLE) b	.79	.64	.68	.64	1.03	.15	.35
Maladaptive Behavior(ABS45) b	20.1	19.62	15.6	13.41	1.59	.06	.35
Tasks Learned			11.63	8.33			
Wages (over 3 mos.)			$84.88	$90.71			

[a]Correlated one-tail t test
[b]Suggestive of educationally significant difference

statistically significant, should be taken as evidence of potential treatment effects. By this standard, the differences in Social Responsibility and Maladaptive Behavior (both measured by ABS) appear to be educationally significant. The scores on Total Deviant (as measured by the NOLE) approached educational significance, offering weak confirmation of the trend in ABS scores. The other variables do not show significant differences.

2. Relationship between vocational skill acquisition and growth in social behavior. A second purpose of the non-vocational evaluation was to explore the extent to which increased vocational competence (as measured by quarterly wages) covaries with more normative social behavior. To do this, the workers were split into two groups -- high wage earners (over $90 per quarter for the last 3 months in the program) and low wage earners (under $90 per quarter). Ninety dollars was the median quarterly wage for this group; also, on the basis of the distribution, it appeared to be a reasonable cutting point. A 2x2 analysis of variance was performed on the data, with one between groups factor (pre vs. posttest). Analyses were performed on all eight dependent measures. We reasoned that if a significant interaction was found, this would indicate differential growth rates. Post hoc tests would reveal whether this favored the high income group. Only one significant interaction was found, for Perceived Competence (B3); $F(1.20) = 5.44$, $P = .03$. For two variables, ABS_{12} and ABS_3, significant effects were found for wage group, but no significant interaction. Table 6.3 reports these descriptive statistics.

It is revealing and encouraging to note that the high wage earners show the most growth in the manner in which their caregivers perceive their competence. Also, by examining the magnitude of effects (as recommended by House, et al. 1979) one notes fairly strong treatment effects (.9 SD units, .67 SD units and .39 SD units) for the high wage earners in these 3 variables, and low or negative effects for the low wage earners.

Because some information may have been lost in the somewhat arbitrary high-low wage-earner median split, the data were also analyzed using a multiple correlation procedure. Because the sample size of 22 is relatively small for obtaining stable coefficients, the analysis was considered exploratory in nature. A hierarchial procedure was used. Each quality-of-life post measure (e.g., posttest NOLE Total Social) was considered the dependent variable in a multiple regression. The first predictor entered was always the pretest on that measure. Next, we examined whether the quarterly earnings for the worker during his/her last 3 months explained a significant amount of the variance not explained by pretest scores. Table 6.4 reports the results. Multiple R^2s are adjusted for shrinkage.

The first variables listed in the table, Becker Perceived Competence, ABS Independence and Social and NOLE Total Deviance,

Table 6.3

PRE AND POST MEASURES FOR HIGH VS. LOW WAGE EARNERS

	Pretest		Posttest		
	Mean (M)	SD	Mean (M)	SD	Magnitude of Effects [a]
Becker: Perceived Competence (B_3)					
High Wage	24.45	7.97	30.0	6.29	.9 SD
Low Wage	20.64	4.54	18.9	5.87	-.3 SD
ABS_{12}: Independence					
High Wage	104.1	17.6	112.5	.0.9	+.67 SD
Low Wage	100.7	18.7	101.5	14.1	+.05 SD
ABS_3: Social Responsibility					
High Wage	44.4	8.7	47.4	6.6	.39 SD
Low Wage	38.3	10.0	39.5	7.2	.13 SD

[a]Expressed in Pooled Standard Deviation Units

Table 6.4

EXPLORATORY MULTIPLE CORRELATIONS

I. Quality-of-life variables with significant proportion of variance explained by vocational outcomes Correlation (r)

Variable	Pre-Post r	r^2	Multiple R	R^2	Adjusted R^2	Added percent of variance
Perceived Competence (B_3)	.55	.31	.70	.49	.43	.18[a]
Independence (ABS_{12})	.73	.54	.88	.77	.74	.23[a]
Social Responsibility (ABS_3)	.65	.42	.79	.62	.58	.20[a]
Total Deviant (TD)	.73	.53	.78	.60	.57	.17[a]

II. Quality-of-life variables with no significant variance explained by vocational outcomes

Variable	Pre-Post r	r^2	Adjusted r^2
Total Social (TS)	.80	.64	.63[a]
Social Initiation (SIS)	.77	.60	.58[a]
Perceived Social (B_1)	.63	.39	.36[a]
Maladaptive Behavior (ABS_{45})	.73	.53	.51[a]

Adjusted for shrinkage

$p < .05$

are variable where vocational outcomes explained significant proportion of the variance, between 17 and 23 percent. For the remaining 4 variables, this was not the case.

The construct for which there seemed to be the strongest relationship is that of perceived independence or competence. Both measures (B_3 and ABS_{12}) were significantly related to vocational outcomes. The construct where there was no discernable relationship appears to be social behavior in the group home setting. The effect for observed deviant behavior, as measured by NOLE, is interesting, perhaps reflecting some generalization of the behavior management aspects of the training program.

On the whole, one sees that for some areas of social life, those who gain the most in vocational training tend to show the most growth in their living situation. It is unsurprising, but nonetheless revealing, that for high wage earners, the strongest effect is in the domain of perceived competence and independence. It is also unsurprising that social behavior, which is not a key element in vocational training, does not show the same effect.

The relatively high pre-post correlations (median r=.73) are promising from a measurement perspective. A truism in educational evaluation (cf. Cooley & Lohnes, 1976) is that on the average, pre-post correlations are moderately high, i.e., all other conditions being equal, those who enter with more skills will terminate with more skills. Effective treatments may help everyone to a large degree, but even then, those who enter with the most will tend to end with the most. Thus the moderately high pre-post correlations give some sense that the dependent measures are reasonably valid, that the rank orderings of individuals are not drastically or chaotically shifting in unexpected directions.

IV. Summary and Limitations

Both vocational and non-vocational effects of participating in the model implementation sites were evaluated throughout the project period. The sixty-three severely handicapped adults who participated in the four implementation sites mastered a wide variety of small parts and electronics assembly tasks and attained productivity and wage levels performing these tasks that greatly exceeding national averages for all retarded adults in sheltered workshops.

Spillover effects were evaluated for the 22 individuals who participated in a site for 12 months without a change in the residential caregiver who supplied data for non-work behavior. Results for the 22 workers indicated slight to moderate increases in seven of the eight measures, and a slight decrease in one measure. Following House et al.'s (1979) policy, results

suggestive of statistical significance ($.15 < p > .05$) were also reported:

1. For Maladaptive Behavior (ABS_{45}), there was a mean difference of .3 SD units, $t_{(20)} = 1.59$, $p = .06$. This result approaches statistical and educational significance.

2. For Social Responsibility (ABS_{45}), there was a mean increase of one-quarter standard deviation units, with $t_{(20)} = 1.34$, $p = .09$, again approaching both educational and statistical significance.

3. Other suggestive differences were in: Total Deviant (NOLE), magnitude of effect = 2 SD, $t_{(20)} = 1.03$. $p = .15$ and Perceived Competence (Becker 3), magnitude = 2 SD, $t_{(20)} = .95$. $p = .18$.

Thus the two constructs for which the most change was detected are Independence and Inappropriate Behavior. Similar changes are not noticed in the domain of social behavior. Considering the somewhat low statistical power of the statistical tests and the convergent trends across measures, the results appear to be suggestive of changes in a positive direction in the two domains of behavior.

Secondary analyses were performed on the results by dividing the workers into two classes, high and low wage earners, using a median split. A significant interaction was found between quarterly wages and increase over time in Perceived Competence; $F_{(1,20)} = 5.44$, $p = .03$. This indicated that the high wage earners (those who profited most from the vocational program) were perceived as more competent by those who supervised their living arrangement. The magnitude of the effect for this group was quite high, nine-tenths of a pooled standard deviation unit. When the descriptive statistics were analyzed, they revealed that the locus of the effect on the ABS measures of Independence and Social Responsibility were also with the high wage earners. Magnitude of effects were .67 SD units and .39 SD units respectively. Exploratory multiple correlations correborate these results.

Basically the evaluation indicated some positive changes in the domains of independence/competence and some decrease in both perceived and observed inappropriate behavior. It further indicated that those who gained the most in the vocational training program (as evidenced by monthly wages) tended to show the most change in these domains, especially those dealing with perceived competence and independence.

This would tend to support our conviction that pre-vocational training that focuses on behaviors for personal independence is not a necessary prerequisite for vocational training. Workers who succeed in the vocational component tend to grow in the areas

of independence and perceived competence, and show some improvement in control of inappropriate behavior. Clearly there is a need to teach social skills to these clients in a systematic way as a supplement to the vocational program, but not a substitute.

Two important limitations in this evaluation deserve particular emphasis. First, there are several important design flaws to a pre-post test design with no control group. The most serious is maturation, that subjects would make similar gains without treatment. This threat seems to be less of an issue for severely handicapped adults. It also seems unlikely that on seven of the eight measures, the group would "spontaneously" improve. Nonetheless, maturation must be considered a threat to the validity of this design. Reactivity is a possibility, but seems less a problem; clients were observed and forms were filled out so often (every 4 months following the time series design) that the typical problem of "second time around" similarity between pre and posttests disappears.

The second limitation is that all model implementation sites were newly established programs, begun with neither experience nor reputation in the local business community. In each site development of regular customers and consequently a regular supply of work was a slow and difficult process that could only be partially assisted by project staff. Because access to work was limited, the vocational data provide an underestimate of the wage earning potential of severely handicapped individuals. Similarly, the non-vocational effects may have been suppressed by the discrepancy between demonstrated vocational abilities and actual earnings. Such gradual development of work opportunities is not inconsistent with start-up periods in many small businesses and workshops. Nevertheless, while it did not prevent impressive vocational achievements, it did artifically constrain the level of vocational development, and possibly, extent of non-vocational effects.

Chapter 7

CONCLUSIONS AND RECOMMENDATIONS

I. Overview

Although research for three decades has illustrated the vocational potential of severely handicapped individuals, community service programs continue to be designed as if either the potential or readiness for work were absent. More than 100,000 handicapped adults are served daily in non-vocational activity programs in the United States, and this number is expanding as more severely handicapped adults become community residents.

The project addressed this discrepancy between research results and current services with several coordinated components. The first component, concerned with development of habilitation procedures applied single subject procedures to solve and report procedures for a variety of practical problems that were encountered in the delivery of habilitation services. A total of 22 research reports and synthesis papers resulted from this effort, with suggestions for improvement of vocational training procedures, production supervision techniques, development of non-vocational competence, and planning of habilitation environments.

The second component, focused on model specification, was charged with defining procedures for a comprehensive community program for severely handicapped adults. A manual detailing these procedures was prepared at the outset of the project, tested throughout the 3-year period, and revised on the basis of that experience.

Development of instruments for program evaluation was the task of the third project component. A total of six instruments were developed or adapted to assess possible changes in the daily lives of severely handicapped individuals outside the work setting. Published research summarizes our methodological research on three of these instruments (Bellamy & Irvin, 1977; Crowell, Weissman-Frisch, Lamson, & Boomer, 1980; Weissman-Frisch, Crowell, Bellamy & Bostwick, 1980). Experience in the use of the instruments provides several guidelines for future efforts to construct multiple - instrument approaches to program evaluation research (Irvin, Crowell & Bellamy, 1979).

The fourth component, charged with model implementation, assisted four community programs to implement the STP model. Implementation assistance involved determining interests and feasibility in potential sites, assistance in organizational development for model implementation, selection and training of staff, selection of severely handicapped workers, program operation, sales of business procedures, and information processing.

The final component, program evaluation, was charged with evaluating the effects of the STP model on the vocational and non-vocational competencies of severely handicapped participants. Data were collected throughout the three year period on a variety of participant behaviors using several different instruments and data sources. Participants learned a total of 43 vocational tasks, performed these at rates that allowed for average hourly earnings of $1.20 while in production. These work-related results were supplemented by measures of nonvocational goals. Observed behavior and caregiver perceptions in unstructured time at home suggest general improvement in deviant behavior measures, and a relationship between remunerative production and measures of perceived competence and independence.

These results obtained across four communities in three states confirm the positive outcomes of the original Specialized Training Program Workshop at the University of Oregon. Together, they have several implications for the design and delivery of community services for severely handicapped people.

II. Implications for Vocational Potential

Severely handicapped individuals often cannot gain access to vocational preparation and employment programs because of the presumption that they lack vocational potential. The belief that many individuals are too severely handicapped to benefit from vocational opportunities is either implied or explicitly stated in several federal and state regulations. For example, the Department of Labor regulations pertaining to sheltered workshops describes work activities enters as programs for individuals whose productive capacity is "inconsequential" (Federal Register, 1974). Further, several states have even established programs that are supposed to prepare severely handicapped individuals to enter these work activities centers.

A major implication of the project is that such division of people, either by federal regulations or local programs, into vocational and non-vocational programs can no longer be justified on the basis of individual vocational potential. The project provided extensive replication of earlier demonstrations that individuals who were presumed to lack potential could develop sophisticated vocational skills. The project also showed that the training and habilitation services needed to develop this competence could be provided in diverse community programs by several different trainers and supervisors and with a wide variety of vocational tasks. Together with other data in the field, the project thus provides a basis for challenging the exclusion of severely handicapped people from vocational opportunities as arbitrary separation and unequal treatment.

From a research perspective the project results directly address many potential external validity limitations of earlier research supporting the vocational potential of severely handicapped individuals. Many of the characteristics of community programs are

difficult to simulate in research and demonstration settings, and as a result the practical utility of reported procedures and successes could be questioned. Thus it is significant that this project achieved the positive results in ongoing community programs. Particularly important aspects of the projects are: (1) the ongoing production environments, which allowed documentation of productivity during full work days over several months or years, instead of the typically short production periods of most existing research; (2) the need to adapt to short term and frequently changing contracts, which enabled demonstration of acquisition of multiple skills and alternative performance of these as production needs arose; (3) the presence of normal production pressures, which allowed the program to demonstrate that severely handicapped individuals could adapt to and meet typical demands of workshop and commercial operations.

A final contribution of the project to the literature on vocational potential is the focus on wages earned by severely handicapped participants. While the acquisition and performance data reported in earlier studies accurately reflects important service outcomes, only wages can index the success or failure of extended employment programs. Wages may be affected not only by the training and behavior management techniques frequently discussed in the literature, but also by the success of sales, engineering, accounting and management procedures. Because of the wide variety of factors contributing to wages in employment programs, it is not surprising that low wage levels in sheltered workshops have remained a persistent national problem (Department of Labor, 1969; Wall Street Journal, 1979). For the same reason, the success of this project in paying wages above the national average for sheltered workshops in newly established programs for severely handicapped individuals is highly significant. Whatever variables may contribute to low wage levels, the degree of handicap of workshop participants clearly need not be a factor.

III. Implications for Organization of Community Vocational Services

The project's success in employing severely handicapped people may have several implications for community services. Project procedures involved significant departures from traditional organization of either sheltered workshops or adult activity programs, and these departures have ramifications for both program staffing and interaction with other vocational services. The first departure from traditional organization resulted from an effort to increase the emphasis placed on the habilitation procedures widely reported in the literature as critical to vocational progress of severely handicapped adults.

Staff resources in most workshops are concentrated in support service areas, with evaluators, counselors, and social workers playing key roles (cf. Whitehead, 1976; Commission on Accreditation of Rehabilitation Facilities, 1978). Floor supervisors and other direct service staff typically receive less attention, less remuneration,

and less status. However, it is these direct service staff persons who typically are charged with implementing habilitation programs for severely handicapped adults. Task analysis, vocational training, and production supervision, all normal responsibilities of direct service staff, have been shown repeatedly to be key procedures in changing the behavior of severely handicapped individuals. Without major staff rearrangement, most existing workshops would experience difficulties in investing significant personnel resources in these new activities. Therefore, an alternative staffing structure was developed in which professional staff were assigned direct service, rather than support service roles. The result of this change was that the project blended business and behavior analysis procedures instead of business and rehabilitation counseling techniques in providing community vocational services. It seems unlikely that more traditional staff patterns would have produced the vocational successes enjoyed by project participants.

A second departure from traditional practice also appears to have major implications for program design. Existing adult services reflect the assumption that only those individuals who can perform skills indirectly related to work (i.e., independent grooming, dressing, communicating, traveling and eating) can be expected to perform those direct vocational skills associated with remunerative employment options. If this assumption is inaccurate, and considerable research suggests that it is, then a large number of potentially productive individuals are being unnecessarily denied access to meaningful employment. In this project it was assumed that the structure of employment and vocational service options, and not the skill deficiencies of severely handicapped individuals, was the major factor in preventing access to work. Accordingly, programs were established that provided access to work opportunities before the many skills indirectly related to work were developed. The resulting success of participants raises important questions about the current organization of community services. Vocational programs have frequently been described as a continuum of services, in which individuals leaving institutions or schools first receive pre-vocational services in activity centers or developmental centers; then move to sheltered workshops when they are perceived to be ready for vocational services; and finally are placed in community jobs (cf., DHEW Report on Deinstitutionalization, 1978).

Data from this project suggest that the pre-vocational services offered in adult activity programs are not necessary precursors of vocational success. Data from other sources suggest that the continuum is more apparent than real, and that the flow of individuals from one program to the next is barely a trickle (Greenleigh & Associates, 1975; Lynch & Gerber, 1977; Whitehead, 1979). As a result, many severely handicapped individuals are permanently consigned to pre-vocational programs where the opportunity to participate in a community's worklife is totally lacking.

As an alternative, the results of this project suggest that community programs can be organized so that vocational opportunities are combined with developmental programming in extended employment

situations. Both the "structured employment" approach advocated by Horner and Bellamy (1979) and the "affirmative industry" model of DuRand and DuRand (1978) provide guidelines for developing an extended employment alternative to traditional workshops. Of course, the recommended emphasis on extended sheltered work for severely handicapped individuals does not represent an argument against developing competitive employment opportunities as well. It simply reflects concern for the current status of over 100,000 individuals who cannot even gain access to sheltered work programs.

Extended sheltered employment for severely handicapped individuals could add a missing element in the array of community services typically provided to severely handicapped individuals. It is clear that many handicapped individuals are capable of greatly increased productivity, although they may require retraining and competent supervision from direct service staff, and may need ongoing support from social service or medical care agencies. Even with this ongoing support, increases in individual productivity could help offset the cost of social services for many people. To allow the need for ongoing services to preclude the opportunity to work, as current policies and practices do, would appear to both exacerbate the handicaps of individual adults and increase the cost of public services for them.

IV. Implications for Federal Program Administration

To the extent that the project results suggest a change in the structure of community-based vocational services, the results also point to several aspects of federal funding and regulations that perpetuate present inequities. Several barriers are apparent in federal programs affecting workshops and adult activity programs.

The first of these barriers relates to disincentives for vocational programs. Much has been written recently about disincentives to handicapped individuals accepting remunerative employment. The loss of public medical assistance, which often cannot be replaced by private insurance, the difficulty reenrolling in income transfer programs, and the loss of access to other public services all make employment for many severely handicapped people correlate with a loss of personal security (Beck, 1979; Pomerantz & Marholin, 1977).

The fiscal contingencies created by current policies result in equally important disincentives to local services providers and state agencies that attempt to provide vocational opportunities. Two major disincentives are apparent for state agencies responsible for administering ADPs. First, the only uncapped source of federal funds that can be used to support community programs is the Title XIX program, which is designed for medical, rather than vocational services. As an entitlement, Title XIX supports all individuals who meet eligibility requirements through the state-federal vocational rehabilitation system.

While involvement by so many agencies attests to the complexity of adult service issues, it has created a situation in which ADPs are essentially hidden from federal view. This situation fragments service efforts by making it nearly impossible to accumulate regular descriptive or evaluative data on ADP services. As a result, service advocates lack information on which to argue for improved or expanded services, better linkages with work programs, or different service guidelines. Until such data are available, it will be difficult to gain legislative support for policies that encourage vocational opportunities.

Another effect of the current mosaic of funding and regulation is inertia. Simultaneous changes in several federal and state programs will be required before significant program changes can be expected. For example, rapid growth in non-vocational ADP services continued in the 1970's despite the passage of the Rehabilitation Act of 1973 that mandated that vocational services for severely disabled persons be given priority. This was, no doubt, partially because more federal funds were available for non-vocational services under the Social Security Act (Title XIX and XX programs).

A related and critical federal policy concern is the issue of entitlement to services. Although the number of severely handicapped people served in Adult Activity Programs has increased rapidly during the last decade, many similar individuals still do not have access to community-based services. Admission to ADPs is often limited both by ceilings on state support for services and by local program perogatives to accept or reject individual referrals. The result is continued dependence on institutional care for many severely handicapped adults who could participate in community services and in the vocational opportunities which this project supports. A clear service entitlement is needed through which either Congress or the courts establish the right of each handicapped adult to needed services in his or her own community.

Finally, the Department of Labor's regulations for sheltered workshops (Federal Register, 1974) appear to provide barriers for local programs wishing to maximize the sheltered employment services of severely handicapped individuals. These regulations differentiate between some sheltered workshop participants who shall be paid hourly wages that are based on productivity measures and others that are only paid piece-rate wages for work actually produced. The distinction between the two classifications is to be based on productivity, so that individuals who achieve above minimum levels receive guaranteed hourly wages. Further, programs for the two classes of participants must be separate, with separate staff, building space, and files. One important practical effect of these regulations is to restrict the availability of work to more severely handicapped workshop participants, who generally fall in the piece-work pay category. Ongoing wage commitments to less severely handicapped individuals ensure that these people receive first access to work in most facilities. As a result, severely handicapped

individuals typically have access to work only periodically during peak contract periods. Thus, low productivity, which is attributed to these individuals in the Department of Labor regulations, might be better attributed to the regulations themselves. The sucess of this project suggests that regulations should be designed to accomplish exactly the opposite of the present effect, i.e., to create incentive for giving the most severely handicapped individuals in each facility the first access to all available work. Not only would this enable these individuals to participate as wage earners, but also might it provide incentives for those with less debilitating conditions to seek out or accept competitive employment opportunities.

V. Implications for Adult Education and Non-vocational Social Developmental Programs

One of the most significant implications of the project's results is that vocational opportunities need not be programmatically separate from non-vocational service efforts. In fact, the results offer a basis for suggesting that both efforts may be enhanced when they are combined.

Whether non-vocational programs are intended as adult education efforts, social and developmental progress, or prevocational services, they are constrained to simulating many real-life situations for which only money secures regular access. Movies, shopping, independent transportation, dating, and most other activities of qualitative independent living presuppose that the individual has some income with which to consume the services and products associated with modern life. The meager income transfer allowances seldom suffice, and as a result training programs seem constantly confronted with the task of motivating participants to learn what they may need to know later but have no use for today. Combining work with other programming alleviates this difficulty. Both the routine requirements of work settings and the wages that result create a variety of immediate needs that can only be met through parallel education efforts. Grooming, transportation, time management, use of work breaks, mobility in the community around the workplace, and communication with co-workers are natural expectations in work settings. The success of the present project in achieving these educational goals in the context of a work-setting suggests that alternatives to current segregation - in both policy and practice - should be devised.

An important advantage of combining work and educational efforts is that it allows programming to focus on current independent living needs and lifestyles. Rather than perpetual preparation for some future period of employment, combined services allow for systematic attention to current environments. As a result, adult education and other social programming might be expected to have much more immediate effects on the quality of individual lives.

VI. Implications for Evaluation of Services for Severely Handicapped Adults

The utility of most popular assessment tools for evaluating the success of model implementation sites was questioned early in the project. Most available instruments were skill lists with which current functioning levels could be indexed through care-giver report. However, since the services provided in the model were viewed as extended employment, rather than preparation for a different program, development of new skills seemed less relevant as a measure of program success than did daily lifestyle.

The success of such a program approach suggests that a new generation of evaluation tools may be timely. These instruments would focus more on daily performance descriptions, rather than on attempts to catalog skills and skill deficits. For example, it seems a more important index of program success to ask whether an individual regularly takes advantage of community recreation opportunities, not whether she/he knows how to do so; that he or she regularly earns wages at work, not just that vocational skills have been learned; or that a variety of community integration experiences are a normal part of the weekly routine, not just that some new social or greeting behavior has been taught.

Clearly, such an attempt to measure lifestyle rather than just skill development in program evaluation efforts will involve both instrument development efforts and, ultimately, changes in service delivery strategies. That effort appears warranted if severely handicapped adults are to be treated as adult community participants rather than eternal children who are expected to master new skills in school each day.

Participating in STP model implementation sites produced both vocational gains and suggestive evidence of a variety of non-vocational advances. The extent of individual progress in implementation sites would appear to have implications for determinations of vocational potential, organization of community vocational services, federal program administration, non-vocational adult services, and program evaluation efforts.

References

Ayllon, T., & Azrin, N. W. Reinforcement and instructions with mental patients. Journal of the Experimental Analysis of Behavior, 1964, 7, 327-331.

APA. Publication Manual of the American Psychological Association, 1974.

Baer, D. M. Prepared remarks at the meeting of the AABT, Atlanta, December, 1977.

Baer, D. M., Wolf, M., & Risley, T. R. Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1968, 1, 91-97.

Beck, B. D. Can you afford to work: A handbook for Wisconsin's handicapped recipients of social security benefits. Wisconsin Council on Developmental Disabilities & Rehabilitation Facilities of Wisconsin, September, 1979.

Becker, W. The relationship of factors in parental ratings of self and each other to the behavior of kindergarten children as rated by mothers, fathers, and teachers. Journal of Consulting Psychology, 1960, 24, 507-527.

Becker, W. C., & Engelmann, S. Teaching 3: Evaluation of instruction. Chicago: Science Research Associations, Inc., 1976.

Bellamy, T. (Ed.). Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol. I. Eugene, Oregon: University of Oregon Center on Human Development, 1976.

Bellamy, T., Horner, R., & Inman, D. Vocational habilitation of severely retarded adults: A direct service technology. Baltimore: University Park Press, 1979.

Bellamy, T., Inman, D. & Yeates, J. Evaluation of a procedure for production management with the severely retarded. Mental Retardation, 1978, 17(1), 37-41.

Bellamy, T., & Irvin, L. Utility of an instrument for assessing labels used to describe retarded adults. In T. Bellamy, R. Horner and D. Inman (Eds.), Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol. 2. Eugene, Oregon: University of Oregon Center on Human Development, 1977.

Bellamy, G. T., Oliver, P. R., & Oliver, D. D. "Operations" In vocational training for the severely retarded. In C. Cleland, L. Talkington, and J. Schwartz (Eds.), Research on the profoundly retarded: A conference proceedings, Vol. 3. Austin, Texas: Western Research Conference, 1977.

Bellamy, T., Peterson, L., & Close, D. Habilitation of the severely and profoundly retarded: Illustrations of competence. Education and Training of the Mentally Retarded, 1975, 10, 174-186.

Bellamy, G. T., Sheehan, M. R., Horner, R. H., & Boles, S. M. Community programs for severely handicapped adults: An analysis of vocational opportunities. Journal of the Association for the Severely Handicapped, 1980.

Bergman, A. A guide to establishing an activity center for mentally retarded persons. Washington: U.S. Government Printing Office, 1976.

Biel-Wuerch, B. Increasing the productivity of a profoundly retarded sheltered workshop employee. In R. Horner and T. Bellamy (Eds.), Habilitation of severely and profoundly retarded adults, Vol.3. Eugene, Oregon: University of Oregon Center on Human Development, 1980.

Boles, S., & Boomer, J. Information processing for habilitation. In T. Bellamy, and R. Horner (Eds.), Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol. III. Eugene, Oregon: University of Oregon Center on Human Development, 1980.

Boles, S., Horner, R., & Bellamy, T. Structured employment of the severely handicapped: Wage and performance data, in preparation.

Campbell, D. T., Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally College Publishing Co., 1963.

Clarke, A. D. B., & Hermelin, B. F. Adult imbeciles: Their abilities and trainability. The Lancet, 1955, 269(1), 337-339.

Commission on Accreditation of Rehabilitation Facilities. Standards Manual for Rehabilitation Facilities, Chicago: Commission on Accreditation of Rehabilitation Facilities, 1978.

Cooley, W., & Lohnes, P. Evaluation research in education: Theory, principles, and practice. New York: Irvington Publishers, 1976.

Cortazzo, A. Activity Centers for Retarded Adults. Washington, DC: President's Committee on Mental Retardation, 1972.

Cronbach, L. J. Essentials of psychological testing. New York: Harper and Rose, 1970.

Crosson, J. The experimental analysis of vocational behavior in severely retarded males. Doctoral dissertation, University of Oregon, 1966. Dissert. Abst. Int. 27:3304.

Crowell, F. A., Weissman-Frisch, N., Lamson, D., & Boomer, J. D. NOLE: The naturalistic observation of severely retarded vocational trainees in non-vocational leisure settings. In R. Horner and T. Bellamy (Eds.), Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol. 3. Eugene, Oregon: University of Oregon Center on Human Development, 1980.

DHEW Report on Deinstitutionalization. Task Force on Deinstitutionalization of the Mentally Disabled, Decision Memorandum, Washington, D. C.: Department of Health, Education and Welfare, Office of the Secretary, 1978.

Department of Labor. A study of wage payments to handicapped clients in sheltered workshops certified under the Fair Labor Standards Act. U. S. Department of Labor, Washington, D. C., 1969.

Department of Labor. Study of handicapped clients in sheltered workshops. Volume II, Washington, D. C.: Department of Labor, 1979.

DuRand, L., & DuRand, J. The affirmative industry. St. Paul, Minnesota: Minnesota Diversified Industries, 1978.

Edmonson, B. Arguing for a concept of competence. Mental Retardation, 1974, 12, 14-15.

Fairweather, G. W. Experimental development and dissemination of an alternative to psychiatric hospitalizations: Scientific methods for social change. In R. Munoz, L. Snoden, and J. Kelly (Eds.), Social and psychological research in community settings. San Francisco: Jossey-Bass, 1979.

Federal Register, Employment of handicapped clients in sheltered workshops, Chapter V, Part 525, May 17, 1974, 17509.

Ferster, O., & Skinner, B. Schedules of reinforcement. New York: Appleton-Century-Crofts, 1957.

Gold, M. Stimulus factors in skill training of the retarded on a complex assembly task: Acquisition, transfer and retention. American Journal of Mental Deficiency, 1972, 76, 517-526.

Gold, M. W. Task analysis of a complex assembly task by the retarded blind. Exceptional Children, 43(20), 1976, 78-64.

Greenleigh Associates, Inc. The role of the sheltered workshop in the rehabilitation of the severely handicapped. Report to the Department of Health, Education, and Welfare, Rehabilitation Services Administration, New York, 1975.

Hersen, M., & Barlow, D. Single-case experimental designs: Strategies for studying behavior change. New York: Pergamon Press, 1976.

Horner, R. H. Stimulus control, transfer and maintenance of upright walking posture with a severely retarded adult. American Journal of Mental Deficiency, in press.

Horner, R. H., & Bellamy G. T. A conceptual analysis of vocational training with the severely retarded. In M. Snell (Ed.), Systematic instruction of the moderately, severely, and profoundly handicapped. Columbus, Ohio: Charles E. Merrill, 1978.

Horner, R. H., & Bellamy, G. T. Structured employment: Productivity and productive capacity. In T. Bellamy, G. O'Connor, and O. Karan (Eds.), Vocational rehabilitation of severely handicapped adults: Contemporary service strategies. Baltimore: University Park Press, 1979.

Horner, R. H., & Bellamy, G. T. (Eds.). Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol. 3. Eugene, Oregon: University of Oregon Center on Human Development, 1980.

Horner, R. H., Lahren, B., Schwartz, T. P., O'Neill, C. T., & Hunter, J. D. Considerations in dealing with low production rates of severely retarded workers. AAESPH Review, 1979, 4(2), 202-212.

House, E. R., Glass, G. V., McLean, L. D., & Walker, D. W. No simple answer: Critique of the "follow through" evaluation. Harvard Educational Review, 1978, 3, 128-160.

Hunter, J., & Bellamy, T. Cable harness construction for severely retarded adults: A demonstration of training technique. AAESPH Review, 1976, 1, 2-13.

Irvin, L., Crowell, F. A., & Bellamy, G. T. Multiple assessment evaluation of programs for severely retarded adults. Mental Retardation, 1979, 17(3), 123-128.

Irvin, L. K., Gersten, R., Bellamy, G. T., Taylor, V., & Close, D. W. The trainee performance sample: Improving vocational skill assessment of severely retarded adults. In R. Horner and T. Bellamy (Eds.), Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol 3. Eugene, Oregon: University of Oregon Center on Human Development, 1980.

Jacobs, J. W. Retarded persons as gleaners. Mental Retardation, 1976, 14(6), 42-43.

Jones, R., Reid, J., & Patterson, G. R. Naturalistic observation in clinical assessment. In P. McReynolds (Ed.), Advances in psychological assessment (Vol. 3). San Francisco: Jossey-Bass, Inc., 1974.

Jones, R. R., Vaught, R. S., & Weinrott, M. Time-series analysis in operant research. Journal of Applied Behavior Analysis, 1977, 10.

Jones, R., Weinrott, M., & Vaught, R. Effects of serial dependency on the agreement between visual and statistical inference. Journal of Applied Behavior Analysis, 1978, 11, 277-284.

Karan, R., Eisner, M., & Endres, R. Behavior modification in a sheltered workshop for severely retarded students. American Journal of Mental Deficiency, 1974, 79, 338-347.

Kazdin, A. Methodological and assessment considerations in evaluating reinforcement in applied settings. Journal of Applied Behavior Analysis, 1973, 6, 517-531.

Knapp, M. S. Applying time series strategies: An underutilized solution. In L. Datta and R. Pearloff (Eds.), Improving evaluations. Beverly Hills: Sage Press, 1979.

Kratochwill, T. R. (Ed.). Single subject research: Strategies for evaluating change. New York: Academic Press, 1978.

Lambert, N. M., & Nicoll, R. C. Dimensions of adaptive behavior of retarded and non-retarded public-school children. American Journal of Mental Deficiency, 1976, 2, 135-146.

Lynch, K., & Gerber, P. Survey of Michigan rehabilitation facilities: Implications for the developmentally disabled. Research Monograph, ISMRRD, Ann Arbor, Michigan: Unviersity of Michigan, 1977.

Martin, A., & Flexer, R. Three studies on training work skills and work adjustment with the severely retarded, Monograph No. 5. Lubbock, Texas: Texas Tech University, Rehabilitation Research and Training Center in Mental Retardation, 1975.

Martin, G., & Pallotta-Cornick, A. Behavior modification in sheltered workshops and community group homes for the retarded: Current status and future considerations. In G. Hamerlynck (Ed.), Applied behavior analysis techniques for the developmentally disabled. New York: Brunner Mazel, 1978.

Mercer, J. Labeling the mentally retarded. Berkeley, California: University of California Press, 1973.

Ms. Magazine, March, 1979.

Nihira, K. Factorial dimensions of adaptive behavior in adult retardates. American Journal of Mental Deficiency, 1969, 73, 868-878.

Nihira, K. Dimensions of adaptive behavior in institutionalized mentally retarded children and adults: Developmental perspective. American Journal of Mental Deficiency, 1976, 81, 215-226.

Nihira, K. Personal communication, 1979.

Nirje, B. The normalization principle and its human management implications. In R. Kugel and W. Wolfensberger (Eds.), Changing patterns of residential services for the mentally retarded. Washington, D. C.: President's Committee on Mental Retardation, 1969, 179-195.

O'Leary, K. D., & Drabman, R. Token reinforcement programs in the classroom: A review. Psychological Bulletin, 1971, 75(6), 379-398.

O'Neill, C., & Bellamy, T. Evaluation of a procedure for teaching saw chain assembly to a severely retarded woman. Mental Retardation, 1978, 16(1), 37-41.

Paine, S., & Bellamy, T. Model development strategies to improve educational services for severely handicapped people. In B. Wilcox and R. York (Eds.), Quality education for the severely handicapped: The federal investment, in press.

Palmer, R. Prediction of work performance and work adjustment in mentally retarded adults. Sweden: Scandinavian University Books, 1974.

Parsonson, B. S., & Baer, D. M. The analysis and presentation of graphic data. In T. Kratochwill (Ed.), Single subject research: Strategies for evaluating change. New York: Academic Press, 1978.

Passini, F., & Norman, W. A universal conception of personality structures? Journal of Personality and Social Psychology, 1966, 4, 44-49.

Patterson, G., & Fagot, B. Selective responsiveness to social reinforcers and deviant behavior in children. The Psychological Record, 1967, 17, 369-378.

Pechacek, T. A probabilistic model of intensive designs. Journal of Applied Behavior Analysis, 1978, 11, 357-362.

Perske, R. The dignity of risk and the mentally retarded. Mental Retardation, 1972, 10(1), 24-26.

Phillips, E. L. Achievement place: Token reinforcement procedures in a home-style rehabilitation setting for "predelinquent" boys. Journal of Applied Behavior Analysis, 1968, 1, 213-223.

Pomerantz, D. J., & Marholin, D. Vocational habilitation: A time for change. In E. Sontag (Ed.), Educational programming for the severely and profoundly handicapped. Reston, Virginia: The Council for Exceptional Children, 1977.

Prill, N. Evaluation of a procedure for teaching generalized tool use skills to a severely retarded person. In T. Bellamy, R. Horner, and D. Inman (Eds.), Habilitation of severely and profoundly retarded adults: Reports from the Specialized Training Program, Vol 2. Eugene, Oregon: University of Oregon Center on Human Development, 1977.

Roos, P. Remarks, Conference on Research Needs Related to the Education of the Severely Handicapped. Princeton, New Jersey: Educational Testing Service, 1975.

Rose, H. Effectiveness and generalization of overcorrection procedures with stereotyped behavior of a severely retarded adult. AAESPH Review, 1978, 4(2).

Schrank, R. Ten thousand working days. Cambridge, Massachusetts: MIT Press, 1978.

Sidman, M. Tactics of Scientific Research: Evaluating experimental data in psychology. New York: Basic Books, 1960.

Skinner, B. Science and human behavior. New York: Free Press, 1953.

Solnick, J. V., Rincover, A., & Peterson, C. R. Some determinants of of reinforcing and punishing effects of timeout. Journal of Applied Behavior Analysis, 1977, 10, 415-424.

Stebbins, L., St. Pierre, R., Proper, E., Anderson, R., & Cerva, T. Education as experimentation : A planned variation model. Vols. 4, A-D. Cambridge, Massachusetts: Abt Associates, Inc., 1977.

Tallmadge, H. JDRP Ideabook. Washington, D. C.: USOE-NIE, 1977.

Urban Institute. Report of the comprehensive service needs study. Washington, D. C.: Urban Institute, 1975.

Walker, H. M., & Buckley, N. K. The use of positive reinforcement in conditioning attending behavior. Journal of Applied Behavior Analysis, 1972, 1, 245-250.

Wall Street Journal, October 17, 1979.

Weissman-Frisch, N., Crowell, F. A., Bellamy, T., & Bostwick, D. A telephone technique for assisting living environments and life styles of retarded adults. In R. Horner and T. Bellamy (Eds.), Habilitation of severely and profoundly retarded adults: Reports from the specialized Training Program, Vol. 3. Eugene, Oregon: University of Oregon Center on Human Development, 1980.

White, O. The "split middle": A "quickie" method of trend estimation (3rd Rev.). Unpublished manuscript, Experimental Education Unit, Child Development and Mental Retardation Center, University of Washington, Seattle, Washington, 1974.

Whitehead, C. Planning and organizing a sheltered workshop for mentally retarded persons. Washington, D. C.: U. S. Government Printing Office, 1976.

Whitehead, C. Sheltered workshops in the decade ahead: Work and wages or welfare. In T. Bellamy, G. O'Connor and O. Karan (Eds.), Vocational rehabilitation for developmentally disabled persons: Contemporary service strategies. Baltimore: University Park Press, 1979.

Zimmerman, J., Stuckey, T., Garlick, B., & Miller, M. Effects of token reinforcement on productivity in multiply handicapped clients in a sheltered workshop. Rehabilitation Literature, 1969, 30, 34-41.

Zimmerman, J., Overpeck, C., Eisenberg, H., & Garlick, B. Operant conditioning in a sheltered workshop. Rehabilitation Literature, 1969, 30, 326-334.